# THE RUBBER AGE

ESTABLISHED 1917

COVERS ALL PHASES OF THE PRODUCTION AND MARKETING OF CRUDE RUBBER AND THE MANUFACTURE AND DISTRIBUTION OF RUBBER GOODS

Vol. 39 JULY, 1936 No. 4

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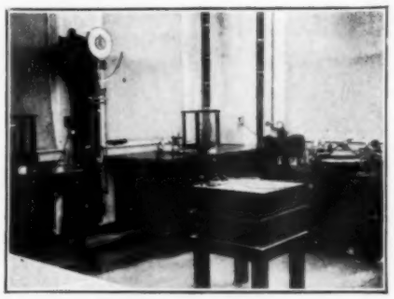

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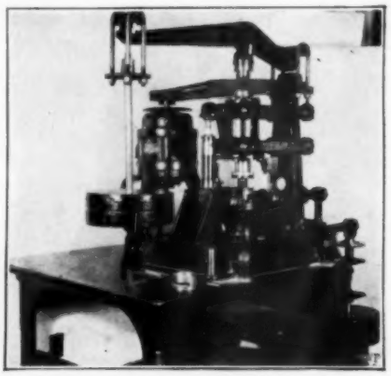

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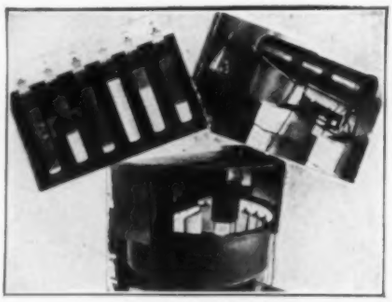

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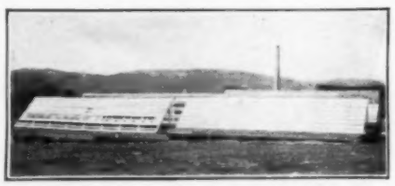

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# The Rubber Business at Home and Abroad

By R. P. Dinsmore

Assistant to Factory Manager, Goodyear Tire & Rubber Co.

**A widely traveled technologist, with long rubber experience, Mr. Dinsmore knows whereof he speaks. In this article, based on his remarks before the Rhode Island Rubber Club on June 4, 1936, he discusses and compares the rubber industries of England, France, Canada, Australia, Russia and Japan. Although he appreciates the fervor behind Russia's aim to produce domestic rubber products, he deplores the poor quality of the finished goods. Japan he briefly dismisses as a "nation of clever imitators with apparently but little originality." Mr. Dinsmore's beliefs with respect to the rubber activities of certain countries, though probably not in accord with other observations, are of exceeding interest, especially in these days of the rapid growth of the rubber industry abroad.**

AN analysis of any American industry, which has as its object forecasting and planning for the future, must consider our unequaled development in the seventy-five years preceding the depression. Has it been due to the national characteristics, the abundance of our natural resources, or to our form of government? Perhaps some light can be thrown on the question by comparing the progress of the various English-speaking peoples, and secondly by comparing various other countries which have different forms of government.

If we are to do this, however, we must remember that the form of government affects the people's activities in proportion to their complexity. Thus a simple agricultural state requires but simple regulation—the collection of taxes, administration of justice and regulation of foreign trade. A complex industrial state, on the other hand, requires sound regulation of the distribution of goods, industrial competition and the many problems raised by specialized labor. In the one case, the form of government is not so important as the honesty of its application. In the second case, proper regulation requires an understanding of and, hence, representation from, all classes and types of activity.

It should be remarked here, that, aside from national customs and habits of thought, the form of social activity has a profound effect on the progress of the people. The industrial state constantly presents the urge to attain higher standards of living. Surrounded by articles of comfort and luxury and subjected to intensive sales appeal, the inhabitant of the industrial state, like a child in a toy shop, wants to buy everything he sees. He is prone to extend his credit to the limit.

If we turn now to the rubber business, a few general facts are of importance. It is said that the first in the field has the advantage. Yet the planting of rubber was started by the English and followed by the Dutch. Cotton was first grown in distant lands and, for years, the spinning and weaving of cotton was almost completely monopolized by England. It is my recollection that the first automobile was made in England and the first pneumatic tire in Ireland. The cord automobile tire was made in England and the forerunner of the non-skid tire came from France. I believe, although I could not find the reference, that the first rubber hose came from England and certainly many of our other rubber goods such as proofed-cloth, rubber shoes and rubber thread came from England and Europe.

### Vulcanization Is America's Contribution

Since the only basic contribution to the Rubber Industry from the United States was the method of vulcanization, it is apparent that our position in the field does not result from being the first in it. Our major contributions to the industry have been in the form of product improvements and new processes. Nevertheless, starting with a registration of four automobiles in 1895 we have now reached nearly thirty million and, as a consequence, reached about 70% of the world's rubber business (since reduced to 50%). Let us ask ourselves again to what extent this has been brought about by our national characteristics, our form of government and our natural resources.

This discussion is not intended to be an exhaustive proof of any thesis. It is merely to indicate certain probabilities, which may justify further thought. Hence, I will not apologize for suggesting at this time that a comparison of the progress of our industry in England, Canada, Australia and the United States indicates that neither natural resources nor yet a liberal form of government can explain the differences. Also, if national characteristics are to be given the credit, they cannot be racial characteristics but rather attributes acquired during a few generations. Comparison of England, France, Germany and Italy, throw further light on the effect of government.

Perhaps from such comparison we shall conclude that stability of government and its recognition of the importance of industry are prime essentials.

We have finally to ask ourselves whether there has been a change in our own rate of progress in recent years. To those who believe that, when the effect of the depression is discounted, as well as the artificial stimulus of excessive government expenditures, our industrial progress has suffered recently, in comparison with that of England, for example, it would appear significant that a deliberately anti-industry attitude in government can go far to offset other advantages. It should be remembered, however, that the cause should not necessarily be attributed to the *form* of government. It may rather be the *attitude* or the administration of government.

Let us return once more to the rubber business. We may fairly consider that industrial development depends upon the ingenuity and mental capacity to invent; the sagacity and vision to select the valuable inventions; and the ability to develop a practical process and dispose of its output at a rate which will furnish all engaged in the enterprise with at least the average standard of living.

Viewed in this light, the contributions of this country to the rubber business meet the first two requirements, but have, in recent years, failed to meet the third. It should be noted, at this point, that in recent years American concerns manufacturing abroad have profited much more from their foreign than from their domestic business.

This directs our attention to conditions affecting marketing. We may first note that, on the average, selling prices abroad are higher relative to the cost of services—both production and selling—than is the case here. The relative costs of materials and equipment, here and abroad, vary more widely due chiefly to the fact that those items peculiar to the rubber business are not produced in all countries where rubber goods are manufactured. However, the net result is a greater profit to the investor abroad than here. This is fostered by and helps to perpetuate a lower standard of living for the foreign workmen.

If any general statement may be made about technological accomplishments in our industry, it is that the foreign technologist has shown outstanding performance in the developments that can be completed in the laboratory while American technologists have excelled in those which must be perfected in the plant. Of course, there are numerous exceptions. As to machine development it has been my observation that the foreign trend is to small, simple machines while ours is to the large complicated type. There are a number of reasons for this some of which will be mentioned.

It is significant that the foreign chemist and engineer are socially much farther removed from the workmen than here. It is perhaps not strange that there is less appreciation abroad of the plant problems and the viewpoint of the workmen, and that this lack of common interest has resulted in fewer plant developments in the rubber business where the supervision is largely non-technical as compared with the purely-chemical business where the reverse is true.

One cannot fail to note also that where the cost is low (as with foreign labor) the urge to save and improve is diminished. Thus, in low labor markets, labor-saving devices are of little interest, while, if *materials* are scarce and expensive, there is greater incentive to develop new and cheaper ones.

### Conservative Tendency Against Changes

There may seem to be some contradiction in the earlier statements that in industrial countries the urge to raise living standards is great and that in European industrial countries the standards are relatively low. The difference is probably brought about by habitual experience abroad with a wide gap between the fortunes of the working class and the well-to-do. There is less expectation of improvement and more tendency to accept existing conditions. This is reflected in less strenuous effort, less initiative and a tendency to prefer longer hours at a slower working pace. Thus smaller, cheaper machines are more economical. There is a conservative tendency to resent change and there is slowness in learning. This is partly inherent in the people, but not entirely, because American concerns have been able by careful selection of labor, adequate training and compensation, greatly to increase the output and initiative of foreign labor.

In certain countries, where government regulation of industry has been carried to extremes, we find many factors tending to increase costs and lower the general standard of living. Some of these result from the action of ignorant officials who wish to assert their authority, others result from attempts to support a weakened currency or to obtain military advantages.

by making the country self-sustaining. Thus there is the attempt to produce materials like rubber and carbon black at any cost, rather than to import them. There is also the government regulation forcing a portion of each concern's profits into the purchase of machinery.

We can hardly avoid a few words about Russia and Japan in our discussion of the world-aspects of the rubber industry.

Russia presents a unique picture. A nation of peasant farmers, it has passed from arrogant imperialism to arrogant communism. Its new leaders have dreamed a dream of industrial revolution on an unheard-of scale. Of course, the people cannot be trained as efficient industrialists in one generation, but in time they may. They are one of the few large nations who would tolerate the pains of transition, but for the great majority of the Russian people any change from their former circumstances must have been an improvement.

### Russia's Poor Rubber Manufactures

The rubber business in Russia cannot be appraised with certainty, both because information is unreliable and because it cannot be measured by our standards. Research, of a peculiar kind, is being carried on on a tremendous scale. There has been much publicity about their plantation rubber and their synthetic rubber. There have been numerous rubber factories—chiefly for tires and boots—erected under the supervision of foreign experts. The result so far has been to make what are probably the poorest rubber products in the world.

Japan can be dismissed in a few words. They are a nation of clever imitators, with apparently but little originality. They have had considerable success in producing articles like rubber shoes and very indifferent success with tires. I suspect that the requirements of the tire business change too rapidly for them. They are out of date before their last copy is made.

In our own country, we have built up a great business on the theory of the economy of mass production. This has meant the concentration of output in a few localities—large units, large machines, heavy capital investment. Our labor rates, by-and-large, have been high. The fluctuations in price of our principal raw materials have been great and frequent. These things have led to practices frequently discussed and criticized. Thus, in order to take care of peak demands, companies have invested heavily in synchronized mechanical units.

When trade is good, the large companies with long materials commitments and efficient machinery can produce and sell profitably at prices which are ruinous to small, poorly-financed competitors. On the other hand, when times are bad and prices of raw materials decline, the small manufacturer, buying at spot prices and, with lower overhead, can trim his production to fit the market and sell profitably below his large competitor's cost. Hence we are injured by bad trade practices brought about both by violent fluctuations in materials prices and by undue concentration of production.

It has become only too clear of late that concentration of the industry has made it vulnerable to the attacks of organized labor. Although the highly-mechanized mass production has permitted the payment of the highest labor rates in industry, the professional organizer, abetted by both national and local politicians, has been able to disrupt production. Yet there is always some benefit to be derived from bitter experience. Individual companies may be damaged permanently, many workmen will be severed from the industry, but eventually the industry as a whole may profit.

R. P. DINSMORE

**A graduate of the Massachusetts Institute of Technology, Mr. Dinsmore has been associated with Goodyear since 1914, serving as chief compounder at the Bowmanville and Toronto, Canada, plants; chief chemist at the Los Angeles plant; chief chemist in charge of all Goodyear plants; and director of research. At present he is assistant to the factory manager. He has made several trips to Europe and other continents in the interests of Goodyear. His observations of the rubber industry in the several countries he has visited at one time or another are partially summed up in this article, combined with his views as to world economics and their effect on the industry.**

It is quite possible that there will be in the future a greater community of interest between the large and small producers. The wise manufacturer will avoid the handicap of the too-highly mechanized plant and with the resulting greater flexibility will no longer be driven to extreme and unprofitable measures to maintain volume in a depressed market. With this disturbing feature minimized there may be a greater tendency to cooperate in the still-serious problem of price fluctuation in raw materials.

### Increasing Prices Is Not Solution

I might logically close this discussion at this point, yet I feel that there is a word of warning due to the critics who come both from within and without our industry. There seems to be a general feeling that all our troubles can be solved by higher prices which are combatted by an obstinate group of rubber officials.

Fundamentally, increasing prices cannot solve the problem, although temporarily it may help.

A better conception of the problem may be obtained if we look at the workman's earning-power in terms of commodities as well as money. Some of his purchased commodities are for immediate consumption, such as food and clothing, and some, such as his home and automobile, are used over a more extended period. Thus it is necessary to consider his productive life as a wage-earner, as well as his yearly earnings.

### The Commodity Value of Wages

If our worker has a productive life of twenty-five years and an average earning power of a thousand dollars per year, he obviously should not plan to expend over twenty-five thousand dollars during his productive life. However, if for one of many reasons, he establishes his scale of living on a basis which will cause him to expend twenty-seven thousand dollars in that period, some condition must be changed. Either he must alter his scale of living or earn more money. The "New Deal" solution is to earn more money, by getting a higher wage scale. Obviously this system cannot give relief to any large number, because if all wages rise, all prices rise, and the commodity value of the wages received is no greater than before.

If our worker were self-sustaining and produced all commodities for himself he would, if his scale of living were unsatisfactory, attempt to improve it by working harder or a greater number of hours. In other words, he would seek to increase his man-output. When man-output rises in industry in general, living standards go up. This may be brought about by working longer hours or by the use of more effective labor-saving machinery, or both.

It is true that individuals cannot, at will, readily increase their working hours in times of depression, because it is difficult to find employment and because there is public sentiment in favor of shorter hours to provide more men with jobs. There is, however, no general willingness to reduce living standards and, in fact, there are powerful forces against it, because the ramifications of industry, each with its specialized workers, have been established to provide the variety of commodities used in a prosperous scale of living.

We are always living beyond our income in prosperous times and, in bad times, a certain number of people have to starve to make up for it. However, in times of depression, we have always in the past studied our production methods and reduced costs or what is the same thing, increased our output per man, so that, on the average, we could pay for most of our purchases. This system is wasteful and painful but it brings progress. It is a system of over-expansion, followed by cost adjustment. It cannot be controlled by one industry, but must be common to all. It is not to be fooled by price juggling or currency tampering. It does not place "human values above property values."

We are sometimes puzzled by the phenomena of over-production and want occurring together. The laboring man thinks it is because the capitalist has grabbed all the money, the capitalist blames the banker, etc., etc. Yet at such times everyone is a loser and, if all plants were manned to capacity, people could not buy. Why? Because the average man cannot produce in his working day his share of the commodities which the country is trying to sell him. And if he can't produce them, he can't buy them.

### Labor Supporting Political Parasites

So, it seems clear, that shorter hours to put more men to work and the use of less labor-saving machinery are working diametrically opposite to the forces of recovery. We can only work shorter hours as we are able to increase our output per individual and we can only have new commodities as we learn to make the old more cheaply. And the more political parasites, pensioners and pan-handlers we carry on the back of industry, the more hours must labor work to pay the bill.

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# Deodorants and Reodorants for Latex

THE growing use of latex made it imperative to develop a new series of aromatic products which could be used effectively in the various latices and which would not be incompatible from a technical point of view. Early in 1935, it became evident that the regular aromatic products which were satisfactory in milled rubber compounds could not be depended upon for use in latex, discoloration, insolubility and coagulation of the latex itself frequently being met with. The methods employed in discovering suitable deodorants and reodorants for latex is told in a recent issue of *The Givaudanian*.

Preliminary tests conducted on three of the better-smelling aromatics from each group of principal aromatic products which were incorporated in 38% and 63% latex in varying concentrations and allowed to stand at room temperatures for one week revealed that the latex was coagulated, the aromatic was thrown out of suspension and there was discoloration in varying degrees. These tests eliminated all aromatics with the exception of those which did not stay emulsified.

An emulsifying agent, compatible with both the latex and aromatic oils was then discovered and tested on all of the non-emulsifying aromatics, with several more products being eliminated by these tests. Several aromatics were then selected, none particularly prepossessing in odor but which were compatible with latex, from tests aimed at learning which aromatics either blended well with the cured latex odor or blended well with the ammonia odor. The final step was the blending of the selected aromatics in the perfume laboratories to overcome odor objections, especially in the cured latex.

As a result of this experimentation, Givaudan-Delawanna, Inc., has recently introduced five new compounds recommended solely for deodorizing latex. They are said to represent a wide variety of odor types and impart their characteristic odors approximately in proportion to the concentration used. For general purposes, where it is only desired to cover the latex compound odors in the cured goods, without giving a definite new scent, a concentration of one-quarter ounce per gallon of compounded latex is recommended by the company.

# Modern Golf Ball Manufacture

## An Account of the Developments Leading to Modern Methods of Manufacture as Compared with Those of Twenty Years Ago

By E. C. Goeckel
Manager, Golf Ball Factory, Wilson Sporting Goods Company

A GREAT many articles have been written on the manufacture of golf balls, but I think that very few realize the many improvements that have been made in this industry during the last twenty years. It might be interesting to point out the evolution of a golf ball and dwell at some length on the many improvements in present manufacturing operations over the methods formerly employed.

When golf balls were first made a silk hat full of feathers was used as a center, and this was stuffed into a leather cover about the size of a hand ball. Then the opening was sewed, and there was your golf ball!

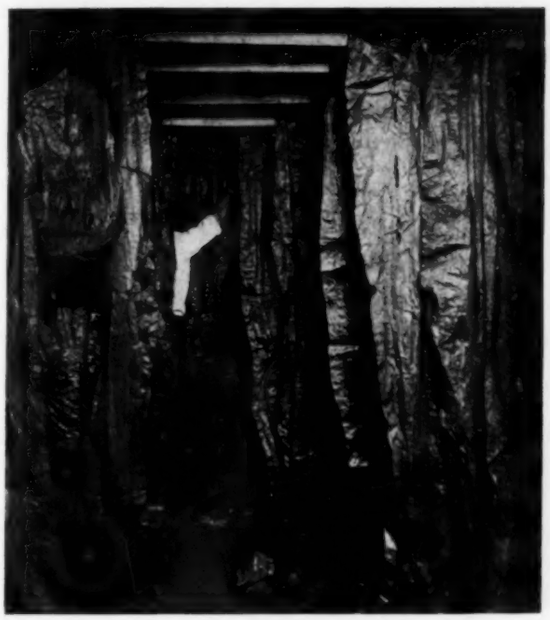
Next came the solid Gutta Percha ball, first with a plain surface and then with different indentations and markings on the surface. This solid Gutta Percha ball did not require any extensive equipment, and it was not until the Haskell patent came out in 1902 that special machinery had to be designed in constructing the center of the new type of ball.

### Haskell Patent Basis of Development

It is quite well known that the Haskell patent covered a series of thread windings by machine over a semi-solid, solid, or liquid center, and the real development period of making golf balls began when this patent was allowed and manufacturers started to make golf balls under it. In my opinion, there has been more development work done on golf ball winding machines than on any other machines used in the making of a golf ball. There are a number of patented machines on the market today, and each one of them embodies some important principle and method of winding continuous rubber thread on a golf ball center, at the same time keeping the ball round and controlling the tension during the winding process.

Today we have several machines that automatically control the degree of tension and wind the ball to a given size and no larger. Compression testing machines have also been developed to determine the exact amount of compression that the rubber windings produce on the core itself, so that we can tell after the ball is wound whether it has the proper compression to be used in the particular type of golf ball it was supposed to be molded into.

Tubing and cutting core stock is one of the first of 62 operations in making golf balls.



Tissued balata, after washing, hanging in the drying room to eliminate all traces of moisture.

In the early days tape windings were put on centers entirely by hand. Today I do not believe there is a single manufacturer who doesn't do this work by some special machine. The second and third windings are also applied through the use of specially designed machines which have been developed to the *n*th degree of accuracy and uniformity. Some of these new machines that are used on the lower grade balls are run at a speed of 3600 r.p.m., and it is very obvious that the mechanism of such a machine has to be correctly timed and be made absolutely "fool-proof" to produce a satisfactory product.

### Deresinating and Precipitating Balata

The cover of a golf ball is a very important part of its construction and one of its vital factors; consequently, great care must be exercised in the preparation of the cover compound, the application of the cover, and the painting. Twenty years ago the purification of balata or Gutta Percha was done in a very

crude manner. Today special machinery has been designed to deresinate and precipitate crude balata without any great danger of explosion or fire, due to the fact that this equipment is all constructed with the so-called "closed system", whereby gasoline and naphtha fumes are drawn away from the cauldrons and kettles, and no injurious or explosive gases remain in the operating room.

This new machinery has resulted in a considerable saving of solvents as well as cutting down the industrial hazards which existed in former days. There has been great improvement in the compounding of cover stocks, so that there is no comparison between the cover stocks used by the majority of manufacturers today and those that were accepted fifteen years ago.

### Painting Machinery Assures Uniformity

Painting of golf balls is another important operation that has given all manufacturers more or less grief. As far back as 1915 all golf balls were painted by hand. In other words, a daub of paint was placed in the palm of the operators' hands, and they would roll two or three balls until the surface was covered with paint. In the last twenty years several different types of paint machines have been developed, which not only bring about more economy in paint application but insure a much better product with reference to evenness of painting, coating, luster, etc.

In late years lacquer has also found its way into the golf ball manufacturing industry, so much so that quite a number of golf balls made today are covered with high grade lacquer. Special machinery has been developed for the application of lacquer, to the extent that as many as three coats of lacquer can be applied to a golf ball in the space of one hour, and this is all done automatically.

If it were not for the mechanical improvements that have been made over the last twenty years in winding machines, refinery plants, painting machines, etc. it would be absolutely impossible for any manufacturer to produce a high grade golf ball for seventy-five cents retail and make a reasonable profit.

In the course of regular present-day production it takes approximately two weeks to make a golf ball from the raw center to the finished, painted ball. There are about 62 operations, 25% of which are accomplished by hand. The major operations in making an average golf ball today are summed up in the following:

1. Assembling or making of the inner core.
2. Winding of rubber thread on the core through the use of special patented winding machines on which the tension is magnetically controlled. The higher class balls have two or three separate windings, whereas the cheaper balls are merely put in a winding machine and wound all the way up to finishing size.
3. Washing, cutting, deresinating, refining and precipitating of crude balata. The finished product from these processes is used as a base of the cover stock, and is molded over the ball after it is fully wound.
4. Molding of the cover stock on the wound center. This is done under a pressure of 2000 lbs. per square inch, and each manufacturer uses different degrees of heat in his processes. This molding operation must be watched very carefully, and the heat processes are controlled by special instruments which regulate the cycles of heat, pressure, and cooling.
5. Finishing of the golf ball including trimming, treatment of the surface before painting, application of white enamel to the cover. Each ball gets three separate coats with a twenty-four hour drying period between each coat, then the stamping, lettering, inspection and boxing.

During all of the sixty-two operations mentioned above, the inspection and check-up work has to be very rigid, because at any part of the process something might happen to disturb the balance of the ball on account of lack of sphericity or insufficient compression. From the time the ball is started until it is finished there are exactly seven inspections and four tests.

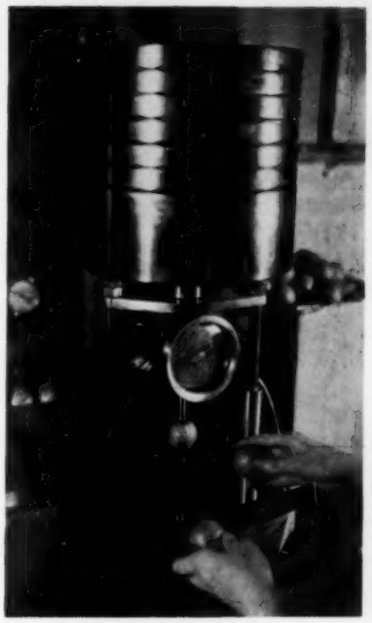
### The Development of Driving Machines

Driving machines can be constructed and adjusted to give either maximum or minimum distance. I, personally, have seen a high grade 75c liquid center ball driven 275 yards carry, which would probably produce another fifteen or twenty yards roll. For the sake of uniformity, however, and to make a comparative test, these driving machines are set to drive the better balls about 230 to 240 yards carry, and then comparisons are made with the other grades right down the line. These machines can also be adjusted to hook or slice a ball, as well as to hit it straight.

**Left: A typical automatic winding machine which also controls the degree of tension. Note the golf ball beneath the circular guide at the upper left corner.**

**Right: Golf ball mold units, such as these, are subjected to pressures of 2,000 pounds and more per square inch, with varying degrees of heat in different processes.**

Left: Economy in paint application, plus the assurance of a uniform coating, has been made possible by the development of paint spray booths such as this.



Right: Compression testing machines now determine the exact amount of compression that the rubber windings produce on the core of the ball itself.

Golf ball molds are very expensive, because they are all hand engraved, and the dimples or mesh marking, whatever is used, must be worked out to the one-thousandth part of an inch. Two cups required to mold one ball cost approximately $15.00 per cup, or $30.00 for the complete mold. The life of these molds, if kept in production constantly, is about four to five years.

It might be well at this point to say a word about the great improvements that have been made in the marking of a golf ball. Every conceivable kind of marking has been introduced and tried out within the last fifty years. I do not think I am far wrong in stating that no less than 450 different designs have been submitted from time to time in the hope that each one of them would have some particular merit over the accepted marking of that day. Golf ball experts know that it is not the appearance or the beauty of a design that makes for a satisfactory golf ball marking. Aerodynamics and ballistics enter into the efficacy of a marking, and a great deal of experimental work has to be done out on the field and on the testing grounds to determine the merits of these markings.

About six years ago the trend seemed to be toward a mesh marked ball, and at that time statistics show the demand was 75% mesh marked and 25% dimple. Today it is just the opposite only that the dimple ball has gained even more in popularity, to the extent that the demand is 90% dimple and 10% mesh.

Most seventy-five cent balls on the market today are made either with a liquid, paste, gelatin or semi-liquid center. Some manufacturers use honey for the filler in the center; others incorporate some pigment in a special liquid, but they all try to make the center for their best ball as soft and pliable as possible in order to get the benefit of the elasticity and rebound from such a center when the ball is hit.

### Differentials in Golf Ball Costs

The fifty cent ball and those down the line all have hard rubber centers, the size of the centers varying from 1 inch in the 50c ball, 1⅛ inch in the 35c and 1¼ inch in the 25c ball. Naturally, the size of the center determines the amount of thread that can be wound on a ball, and this brings about the differential in cost.

In the development of golf balls it is only fair to state that chemistry has played a big part. No recognized golf ball manufacturer can get along without a chemical laboratory. In addition, they must employ expert rubber chemists and men who make a study of the characteristics of balata and rubber. Many of the developments on golf balls can be credited to the untiring efforts of these chemists who are experimenting all the time. In addition to their analytical work their main function in any factory is to constantly be working on new ideas on how to improve the internal construction and the cover of a golf ball.

While many mechanical improvements have been introduced in golf ball manufacture, it is the writer's opinion that we have not yet reached the ultimate of perfection in golf ball making, and new methods and machinery will continually be introduced from year to year. This is an industry where development work both from a mechanical and scientific nature is constantly required.

## Latex-Impregnated Packing Material

A NEW type of packing material, especially suitable for the packing of hygroscopic articles or goods which require protection from rain, dust and foreign materials during shipment, such as crude rubber sheets, has been developed by Harald Hestnes, of Norway. Termed "Plykraft," this material consists of a composite sheet made from creped kraft paper and a latex composition, and is said to combine good flexibility and physical strength with resistance to water and moisture. These properties may be regulated within wide limits to meet varying requirements, according to Plykraft, Ltd., Tollbodgaten 4, Oslo, manufacturers of the new material.

Due to the physical strength of Plykraft and its latex adhesive power, it is claimed that when used as baling, iron straps and wires may be entirely eliminated. The bales may be easily mended by patching, with latex used as the adhesive. Where rubber sheets are concerned, the inside of the Plykraft sheet is given a coating with a rubber repellent substance which prevents the fibres of the paper from sticking to the rubber. This Plykraft material is said to be the lightest packing material ever used for the packing of rubber and to have many advantages over other types of packing materials.

# Synthetic Rubber from Butadiene

PRACTICALLY all of the synthetic rubber now being produced in the U.S.S.R. (Russia) is made from 90% alcohol by what is termed the S.K.B. process in which butadiene is manufactured from ethyl alcohol and then polymerized into rubber by means of metallic sodium. According to a report in the April 24, 1936, issue of the *Chemical Trade Journal*, which was based on an article published in German in a recent issue of *Chemiker Zeitung*, the technical manufacture of butadiene from ethyl alcohol as practiced by Russian chemists follows the method developed by S. W. Lebedew (B. P. 331,482).

In the Lebedew process, the lower alcohols either alone or in admixture, are subjected to high temperatures at normal or reduced pressures, preferably with the addition of an inert gas, in the presence of both water- and hydrogen-splitting catalysts, such as the hydrosilicates or oxides of aluminum, together with the oxides or salts of zinc, manganese, etc., the equation being

$$2CH_3 \cdot CH_2 \cdot OH = 2H_2O + H_2 + C_4H_6$$

In practice, atmospheric pressures and temperatures of 400° to 450°C. are used. With ethyl alcohol, the theoretical yield of butadiene is 58.7%, but no catalysts have hitherto been found which promote the simultaneous equimolecular formation from the alcohol of hydrogen and water; and in practice about 30% of butadiene on the weight of the alcohol has been the highest yield obtained, ethylene, acetaldehyde, ether, butylene, and butyl alcohol being the unavoidable by-products. It has been found essential to reduce the acetaldehyde content of the crude butadiene to below 0.05%.

The actual polymerization process used in the Russian synthetic rubber factories is described as follows: The operation is carried out in an autoclave (of 1.43 meter diameter; 1.602 meter height) which consists of a jacketed vessel within which is inserted a cylindrical sheet-iron vessel (3 to 4 mm. thick). This cylindrical vessel is the actual polymerization chamber. Its upper edge carries a removable ring of angle iron around the circumference of which are 72 cogs or projections. To 36 of these projections are attached 12 each, and to the other 36 projections 6 each, of zinc rods, 110 cm. long and 0.6 cm. thick. Altogether 648 zincs dip into the mass when the chamber is filled.

Before charging, the sides and bottom of the chamber are coated with a mixture of one part of glycerol and one part of talc to permit easy removal of the finished product. Before every operation the autoclave is carefully cleaned, it being especially necessary to remove every trace of water or sodium. To prepare the catalyst, the zinc rods are treated for one hour with warm 10 to 20% solutions of hydrochloric or sulfuric acid, and thoroughly washed. They are then dried and dipped into molten metallic sodium. Sodium consumption is about 0.5% of the weight of the butadiene. The rods are then dipped twice in paraffin heated to 70° C. The inner chamber with the prepared catalyst is now inserted into the autoclave and the latter examined for tightness, preferably with nitrogen at 8 atmospheres pressure over two hours. The butadiene is charged into the autoclave by its own pressure.

The plant used at one of the Russian synthetic rubber factories (Jaroslawl) takes a charge of 1700 liters of butadiene (70 to 80% actual butadiene content), and gives a yield of about 83% of synthetic rubber. After charging, the autoclave is heated to 30°C., at which point the reaction commences. In general, polymerization takes 90 to 120 hours, and the best conditions are 65°C. and 8 atmospheres pressure. Towards the end of the reaction the temperature falls to about 40°C. The temperature is maintained at this point for 3 to 8 days to ripen the rubber. The unreacted butadiene and the pseudobutylene are then removed by heating.

## Vulcanosol Colors for Latex

A LINE of dispersed organic dye colors, especially produced for use in connection with latex and artificial latex, is being introduced by the General Dyestuff Corporation, 230 Fifth Avenue, New York City, under the trade name of Vulcanosol Colors. These colors are pigments in the form of aqueous pastes, and are said to fill the requirements essential to colors used with latices. They are water-insoluble, resistant to weak alkalines and acids, are finely ground and therefore disperse readily, and do not influence the stability of the mixes.

The Vulcanosols have all the fastness properties of the high grade rubber colors, and are especially fast to light and vulcanizing, insoluble in rubber, have no effect on the vulcanization and are not detrimental to the aging of rubber products. In practice, the Vulcanosols are ground with the compounding materials, such as accelerators, sulfur, zinc, etc., before they are added to the latex, with ball and funnel mills being recommended for that purpose. For good dispersions, the company recommends the addition of Vultamol, a latex stabilizing agent. Several colors are available.

## Slipknot Rubber Splicing Compound

INSULATING material used in transport work operates under arduous conditions as a rule, with early failures constantly reported in cases where the material used for insulation is exposed to mud and rain. A new insulating material, marketed under the name of Slipknot Rubber Splicing Compound, a product of Rotunda, Ltd., Denton, Manchester, England, is said to overcome most of the difficulties heretofore experienced in this connection. Normally sold in 8 ounce rolls, ¾ inches wide, this material is in the form of a black rubber tape interleaved with a protective layer of red cloth, the layer being removed when a length of tape is required for lapping two-way connectors. When lapped on to a joint with a slight tension the tape molds itself into a solid piece which is said to withstand high dielectric stresses, without any heating or vulcanization. Tests have indicated that the Slipknot compound is virtually unaffected by weather conditions. Combined with a tensile strength of about 250 pounds per square inch, tests have also indicated that a lapping of 0.245 in. radial thickness withstands a voltage of 35,000.

# Goodyear's Early Experiments with Hard Rubber Novelties

**No. 3 of a Series**

By P. W. Barker

**In This Installment the Author Describes the Medals Awarded to Charles Goodyear at the Height of His Career and Also Several Pieces of Hard Rubber Jewelry Which He Designed in Cooperation with Various Artists — all of which Are Included Among the Goodyear Relics at the Smithsonian Institute at Washington, D. C.**

**Front and back views of the large gold medal awarded to Charles Goodyear in 1855 at the World's Fair, in Paris.**

CHARLES Goodyear began his rubber experiments and investigations, according to one of his biographers, James Parton, in a small dwelling in Philadelphia in the winter of 1834-35. "He melted his gum by the domestic fire, kneaded it with his own hands, spread it upon a marble slab, and rolled it with a rolling pin. A prospect of success flattered him from the first and lured him on."

Among the precious Goodyear relics in the Smithsonian Institution, at Washington, D. C., can be seen today the evidence of his early success at rubber manufacture which urged him on to discover the process of vulcanization in 1839. There is the large silver medal of the American Institute awarded him in 1835 for sheets of India Rubber.

Other medals tracing his early success, on display in the glass top case, are the silver medal of the Mechanics Institute of New York, 1835; silver medal of American Institute, 1836; another silver medal of Mechanics Institute, 1836; gold medal of American Institute, 1844; two silver medals of Massachusetts Charitable Mechanic Association, 1844; medal of Grand Council of London, awarded at World's Fair, 1851; medal of Exhibition of the Industry of All Nations, New York, 1853; and the most beautiful of all, the large gold medal (almost 2½ inches in diameter) of the Exposition Universelle, of Paris, 1855; and there is the medal and ribbon of a French Officer of the Legion of Honor, awarded by Napoleon III, in 1855.

Small imagination is required to recapture the thrill which must have been Charles Goodyear's in receiving all of these medals, especially the gold medal of the World's Fair, of Paris, in 1855, reproduced in connection with this article.

Parton says, "At the London Exhibition, he had a suite of three apartments, carpeted, furnished, and decorated only with India rubber. At Paris, he made a lavish display of India-rubber jewelry, dressing cases, work-boxes, picture frames, which attracted great attention. His reward was a four days' sojourn in the debtors' prison, and the Cross of the Legion of Honor. The delinquency of his American licensees procured him the former, and the favor of the Emperor the latter."

Despite debtors' prisons, and Charles Goodyear had perhaps more than his share of them, he also had moments of high elation. The other reproduction appearing with this article is that of an exquisite piece of hard rubber jewelry, lavishly decorated with diamonds and rubies. It is known as a chatelaine, to be worn by a lady at her waist, and the one illustrated has a watch key on one chain, a watch on the middle chain, and a seal on the other.

What makes this chatelaine of more than usual interest is the fact that it is an exact reproduction in hard rubber and gold and gems of a gold chatelaine given Mr. Goodyear by the Empress Eugenie in Paris in the period of his greatest triumph.

Choice pieces of hard rubber jewelry and objects of art shown by Charles Goodyear at London and Paris in 1851 and 1855 may be seen today at the Smithsonian Institution. Space does not permit of more than an enumeration of these remarkable relics: (1) Locket, gold frame, floral design in diamonds; (2) bracelet, 7 carved hard rubber medallions in gold frames; (3) necklace with locket, beads, hard rubber and gold links; (4) watch chain, links of hard rubber encircled with twisted gold wire; (5) watch chain, 6 hard rubber links joined by gold links; (6) belt buckle, intricate carving of 4 deer in forest; (7) belt buckle, 4 deer in forest, twisted gold wire frame; (8) seven hard rubber buttons in gold frames; (9) cuff button set, 4 buttons

each with single cut diamond; (10) walking stick molded to represent bamboo, gold ferrule and name plate.

(11) Folding fan, 10 punched segments; (12) snuff box, facsimile of Grand Council Medal; (13) paper weight, hard rubber carving of stag; (14) paper knife, hard rubber handle and blade, ornamented with diamonds; (15) table mirror, hard rubber pedestal and frame, 12 inches high; (16) hard rubber knife, plated with gold by some unknown process, 14 inches long, has imprint from Goodyear coat-of-arms; (17) hard rubber napkin ring, delicately carved, "Cynthia" engraved on side—Cynthia was the name of a daughter of Charles Goodyear.

### Goodyear Relics Valued at $10,000

All of these objects are well constructed, artistically carved, and richly ornamented with gold and diamonds. Outstanding in the exhibit, of course, is the chatelaine described and reproduced. Whatever artist assisted Mr. Goodyear in the manufacture of these objects, he was of a high order of ability and taste, and he had a propensity for duplicating the forms of deer and foliage. The appraised value of the Goodyear exhibit, according to museum officials, is over $10,000.

In the same case with the medals of honor and rich jewelry appears a letter written in ink in the handwriting of Charles Goodyear which is evidence that things were not always riches and honor with him, and which is quoted below. "Friend William" is none other than William C. de Forest, brother-in-law to Goodyear, who is reputed to have advanced the inventor a total of $46,000, an amount he did not live long enough to repay. This letter marks the beginning of such loans.

"New Haven, Decem. 15/40

"Friend William:

"I have succeeded in making a sale of $50 and shall not want more money before I get to Boston. By the 25th I shall feel obliged if you will authorise me to draw on some person here at sight or a few days sight for a part, say $75, or remit me a Draft (City Bank draws on Boston) and at the same time allow me to draw at 30 days for the difference if I want.

"I suspect I am quite as able to pay you the $100 as you are to lie out of it but as my own money is not zackly my own, but India Rubbers, I will feel obliged to you for your Indulgence in that, and request you to make all your charges of damage to that Mighty Elastic Substance.

"I am truly yours

"CHARLES GOODYEAR

"You will do me a favor if you will give me the size of your waggon cloth by first mail to Northampton. I want a new article put to the severest test for that purpose."

(The word exactly, spelled "zackly" in the above letter written by Goodyear to "Friend William," is in accordance with the spelling of the original letter—EDITOR.)

**A chatelaine, of which the above is a reproduction, was given to Charles Goodyear by the famed Empress Eugenie.**

## Chlorinated Rubber in Tars

IN general, rubber is incompatible with high-temperature tars, but forms stable combinations with vertical retort and low-temperature tars. This conclusion was reached by the Technical Research and Development of New Uses Committee of the Rubber Growers' Association, and was revealed in the recent annual report of the Association. The incompatability was found to be due to the presence of a large proportion of crystalline products, such as anthracene, in coke oven and horizontal retort tars. Soluble rubber, however, obtained by continuous extraction of latex by ether, forms stable mixtures even with coke-oven tar.

Rubber is most readily incorporated in tar by applying the homogenizer to mixtures of latex and suitable tars. Chlorinated rubber dissolves readily in high-temperature tar oils and is not precipitated on adding pitch. The effect of small proportions of chlorinated rubber on tars is noteworthy, according to the Committee's report, the resultant products being characterized by a high degree of elasticity. In its behavior with tars, rubber hydrochloride resembles chlorinated rubber more closely than it does natural rubber. Rubber has been employed as a filler for synthetic resins, and the molded products compare favorably with trade products when submitted to breakdown voltage tests.

During the past year the Committee for New Uses developed a new chlorination procedure on the basis of a very active reagent in the reaction mixture as the chlorination proceeds. This method is said to have given surprisingly promising results, the first product being a chlorinated rubber containing 60% of chlorine, which is soluble in acetone and benzene.

# Kleinert's Rubber "Gym Gobs"

## Originally Introduced as an Aid to Reducing These Rubber Slacks, Shorts and Shirts Are Finding Additional New Uses

FOR dozens of years the rubber industry has individually and collectively endeavored to change the attitude of the public in respect to the characteristics of rubber in certain products. To some extent it has succeeded, but there still remain thousands of people to whom the word rubber conjectures up a picture of a smelly, tacky material, which, when put into garment form, brings sweat to the body pores.

Unfortunately, the public cannot be mass educated to appreciate the vast progress made in rubber compounding which eliminates the natural odor of crude rubber, which results in smooth, uniform under and outer surfaces, and which accomplishes so many other ends. True, for certain purposes, rubber products are made to retain the tackiness and other properties which the word "rubber" indicates to the uninformed, but these are special cases.

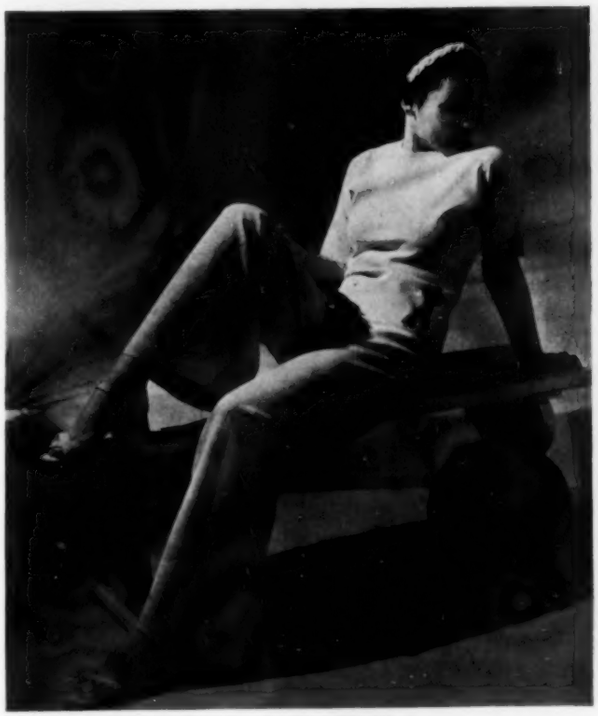
### Gym Gobs Made of Crepe Rubber

Executives of the I. B. Kleinert Rubber Company, appreciating the attitude of a portion of the public in this regard, recently decided to capitalize it, with the result that at the beginning of this season there appeared on the market a line of rubber products under the Kleinert trade-mark, known as Gym Gobs.

These products, or garments, included rubber slacks, shirts, shorts, halters and bras, and were introduced as apparel for wear during exercising to aid in reducing, the rubber effectively working up body sweat. Since then, however, the attractiveness of the garments in this line has expanded its usefullness, and now, in addition to their reducing functions, they are being worn for style and comfort at beaches, around the house and garden, and for other purposes, including swimming.

The Gym Gob shirts, shorts and slacks, as well as the halters and bras, are all made of dull oyster white crepe rubber, similar to the material used in the Kleinert rubber bathing suits. Each item is ornamented with a miniature gob, or sailor. Made from sheet rubber, blue in color, these decorations are cemented onto the garments prior to the finishing operation during which they are pressed into the material and are level with the surface. In this manner the decorations are not torn off during the life of the garments. Because of the color contrast—blue against white—they lend an air of insouciance to the Gym Gobs.

The flare cuffed slacks are designed to give plenty of room for action and are similar to ordinary slacks in style, with the exception of the middie blue gob which appears at the bottom of the left trouser leg. The crew necked rubber shirt resembles a sweat shirt in design and is highlighted with a tricky little dark blue gob applique at the lower left. This shirt, like the other Gym Gob articles, can be cleaned free of perspiration by wiping with a damp cloth, dried with a dry cloth, and its newness preserved by a dusting with certain powders, such as Kleinert's Mirelle Powder.



Crepe rubber, with a fabric-like finish, is used in the manufacture of the Kleinert "Gym Gob" line of apparel.

Attractive in a sporty, nonchalant manner, the shorts are also in oyster white accentuated by a modern gob, with three buttons at the upper left and the applique at the lower left, while the halter, which is said to fit and flatter the figure, has the blue decoration at the upper left, and ties at the back.

The Gym Gob line also includes a lightweight rubber shirt for men which may be worn over a bathing suit, or used for golfing, tennis, fishing and other sport activities. The crepe rubber used on all of the Gym Gobs resembles a rich dull surface crepe fabric. For swimming purposes, Kleinert is merchandising a crepe rubber bathing cap to match the rest of the ensemble.

Kleinert also introduced two interesting rubber undergarments at the recent Notion and Novelty Show held in New York City. One of these was a reducing garment made of Sturdi-Flex, a new fabric in which rubber predominates, and which is claimed to be the only odorless reducing fabric made, while a dainty undergarment termed Braform was introduced which serves the double purpose of creating a flattering bust line and at the same time affording perspiration protection by means of attached dress shields, believed to be a new development in undergarments of this type.

## Testing Electric "Tree Wire"

BECAUSE of the apparent need for standard specifications for electric "tree wire", the abbreviated description for a conductor insulated with a rubber compound and covered with an abrasion-resistant covering which is used for the extension of overhead electric distribution lines through trees,

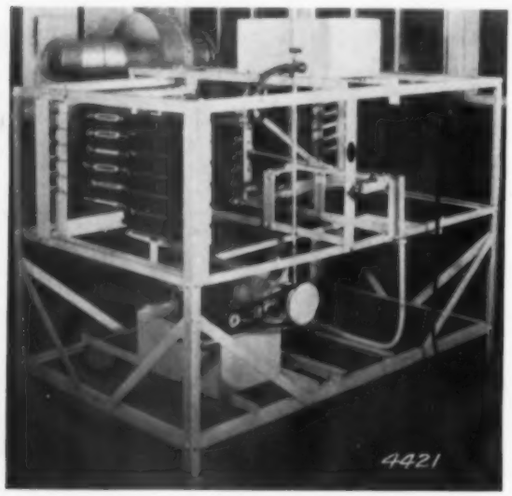



Fig. 1

Technical Committee 8 on Fibrous Coverings of the American Standards Association Sectional Committee on Insulated Wires and Cables, was recently instructed to undertake the preparation of such a standard. One of the Committee's first steps was the development of two testing machines of the performance test types, to determine melt, drip, bend, moisture, and abrasion.

For the most part little machine development was necessary for the testing of melt, drip, bend, and moisture. The abrasion test, however, presented more difficulties, the Committee finally devising and proposing the testing machine illustrated herewith under Figures 1 and 2.

Figure 1 is a general view of one design of the machine which is motivated with a ¼ h.p. a.-c. motor

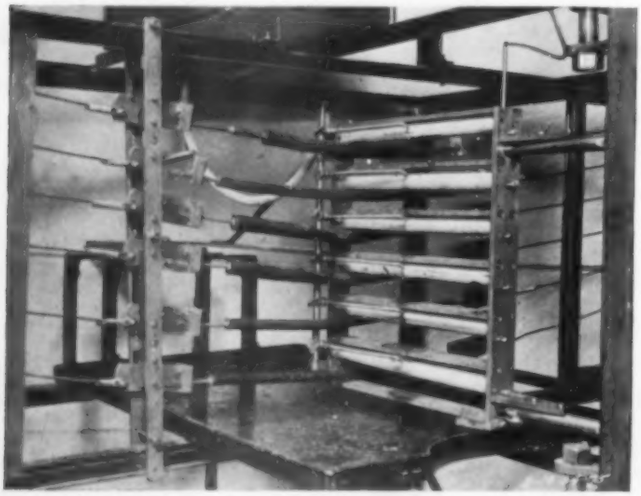


Fig. 2

with suitable reduction gears. Spring balances and turnbuckles are used to indicate and adjust, respectively, the tension in the specimens. Provision is also made to subject the specimens periodically as abraded to water supplied from the tank seen in the top of the supporting frame.

Figure 2 is a close-up of the dowel carrier, showing the specimens of tree wire in testing position and contacting the dowels for abrading the wire. The specimens, suspended between two points five feet apart in a horizontal plane, are pressed continuously against the dowel, which is ⅞ inch in diameter and of definite hardness, with a normal force of 20 pounds. Abrasion is produced by a rotary movement of the dowels in a horizontal plane with a motion similar to that of the connecting rod of a reciprocating engine.

As a result of the tentative specifications made possible by this abrasion testing machine, which is described in the May, 1936, issue of *Industrial Standardization*, an improvement in the more popular makes of tree wire is reported. The Committee is continuing its investigations.

## Daxad Dispersing Agents

SEVERAL types of dispersing agents have recently been developed by the Dewey and Almy Chemical Company, Cambridge, Mass. Known under the trade mark of Daxad, they constitute various polymerized organic salts of sulfonic acids of the alkyl-aryl type. Applicable to a wide variety of uses, these dispersing agents generally result in increased reactivity of the dispersed phase, maximum color strengths, covering powers, etc. Certain of them allow an increased output from tube or ball mills in dry or wet grinding, also permitting finer grinding than otherwise. It is also claimed that products dry ground with Daxads are more perfectly dispersed in water.

Being true dispersing agents, Daxads lower the apparent viscosity of concentrated dispersions and emulsions, thereby requiring less water to yield the same fluidity. Their use during grinding or in the forming of dispersions is said to often permit fine classifications of materials by either air separation, wet flotation or wet classification. Some of them are specific emulsifying agents which permanently stabilize most emulsions against breakage by boiling, freezing, or the addition of acids or salts, also permitting the making of acid or neutral, as well as alkaline, emulsions with various hydrogen ion concentrations.

In general, the company claims that Daxads do not break down solids or liquids which must be done by some form of grinding apparatus, but once a solid or liquid is reduced in size they help to keep the particles separated, free to act as entities, thereby aiding grinding or dispersion. Although neutral, they act as dispersing agents in both dilute and alkaline solutions. All but one series of the Daxad dispersing agents do not materially lower the surface tension, keeping foaming at a minimum.

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In a recent paper delivered before the Institution of the Rubber Industry, at London, T. R. Dawson, noted rubber technologist, discussing the inflammability of rubber, defined fireproof rubber as one which does not propagate flame, although it may char, break down to gas and burn locally in a strongly heated zone, the flame extinguishing spontaneously when the source of heat is removed.

## Latex in Road Use

FOR a period of more than two years, Massachusetts road engineers have been experimenting with latex compounds as a filling material, and if the present trials on roads in the State continue to prove satisfactory it is probable a large use of rubber latex will result. Experiments with latex on roads have been carried on in various corners of the world for several years, but in few cases were the roads and highways exposed to the freezing and thawing conditions found in northern climates. Rubber-surfaced roads have been tried out in New England, but short life under sunlight and poor adhesion to outdoor pavements have been insurmountable practical difficulties.

When cement roads were first built in Massachusetts, according to the Public Works Department, there was no fixed uniformity of strips, and the lack of a binding material between the stretches of concrete often resulted in one or both concrete slabs heaving upward at a joint and creating a danger spot.

Because of extremes in temperature, which cause expansion and contraction, a three-quarter inch space had to be left between each slab. For fifteen years asphalt was used to fill these joints, but it was forced above the road level when expansion occurred and did not recede properly when contraction took place, thus creating hard ridges, the spaces from which the ridges came eventually filling with water, with disastrous results to the comfort of the traveler of the roads.

In an attempt to locate a suitable filler, the Public Works Department of Massachusetts tried out a special molded material made of a mixture of rubber and cork, with a layer of asphalt on top. In use, however, this material continued to force its way above the surface of the highway with the result that it was abandoned.

The latest composition to be tested, one which after two years apparently overcomes the difficulties found with asphalt compositions, is a latex compound. Packed in sealed drums, this compound does not have to be heated before being applied. It is of a creamy consistency and vulcanizes in two weeks to a compressible elastic mass. Some of it is brushed over the edges of the slabs to form a priming coat. Upon being poured into the joint, the latex coagulates immediately, and quickly seals both the end and top of the joint against water, sand and gravel.

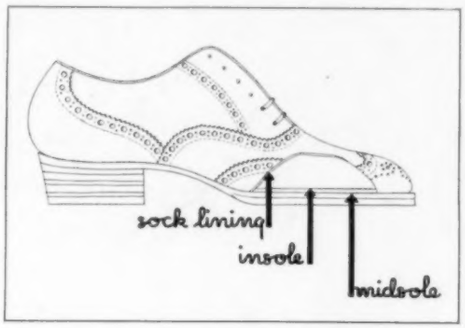
According to a recent issue of the *Industrial Bulletin*, issued by Arthur D. Little, Inc., of Cambridge, Mass., the cost of latex bonds per road mile is approximately $1,200. Maintenance costs on the present asphalt joints, however, are so great, that the additional initial cost of the latex bonds is apparently a net economy. While it is still too early to make predictions for the future, no serious drawback has yet been found, and engineers throughout the country are watching the experiments with interest. The latex composition is being used on both maintenance work and in the building of new highways.

## Rubber-Marble Floors

A PROCESS for the use of plastic rubber in place of cement in the laying of jointless terazzo floors has been developed by Commercial Marble and Tiles, Ltd., Selborne Gardens, Newcastle-upon-Tyne, England, a firm of mosaic specialists. The process is said to produce a noiseless marble floor equal in appearance to cement terazzo and laid in a large range of colors. Chippings of marble mixed with plastic rubber produce a compound which is easily laid in a semi-fluid state, according to the company, and is adhesive to wood, concrete, steel or a cork underlay. It is claimed to be equally serviceable for ships' decks, and all types of buildings. The plastic rubber surface, in addition to having wearing qualities equal to those of cement terazzo, has the advantage of being skid-proof, silent and easily cleaned. The rubber, being plastic, is not as liable to cracking as the harder cement terazzo.

## Pontex—A Latex-Saturated Material

A NEW material, described as a latex-saturated, paper-base product, which has a variety of uses in industry, particularly in the shoe manufacturing field, is being produced by the Fabrikoid Division of E. I. du Pont de Nemours and Company, Inc., at its Brattleboro, Vermont, factory. The method of




Three uses for Pontex in shoes

manufacturing this material, which has been termed "Pontex", as well as some of its applications, is described in the June, 1936, issue of the *Dupont Magazine*.

Made on paper making machinery, the ammoniated latex is flowed onto a wet sheet which has as its base special cellulose fibers of two kinds originally fed into the beater, squeeze rolls taking off the excess latex as well as forcing it into the water-separated fibers and filling the pores uniformly to make the finished product tough, resilient and durable.

For certain purposes, such as midsoles, a special device at the finishing end of the machine plies the material eightfold, an operator removing the sheet along its whole length by means of a knife after the eighth ply is laid. After drying, and before the stock is calendered to the required iron—the shoe industry's unit for measuring thickness—its bulk is again increased by adding approximately 5% of water. The calendering produces a surface with a leathery feel.

In addition to its use in the shoe industry—where it is already being used for insoles, midsoles and sock lining—Pontex, which is said to handle well in all stitching operations besides cutting cleanly without a ragged edge, is being adopted as a sacking material for such materials as coal and cement and others which may be damaged through wetting. In a recent test, a single-ply bag was filled with 25 pounds of coal, immersed in water for 48 hours, and then withstood excessive rough handling. Other uses for this latex-saturated material include panel boards, collapsible-top boots and anti-squeak packing, all in the automotive field. The Brattleboro plant is said to be in full production on Pontex.

# New Equipment

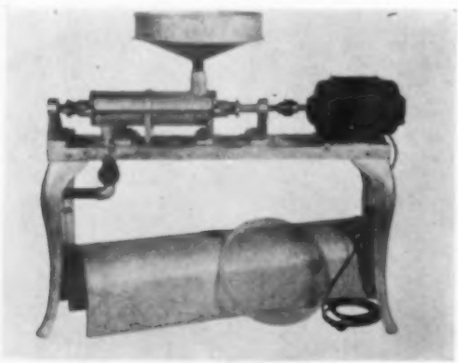
## National Power Operated Drum

A POWER operated drum with under cut, high crown profile, designed for heavy duty, dual bead tires, is being featured by the National Rubber Machinery Company, Akron, Ohio. The drum is col-

lapsed by power from the building machine to fully clear the beads and permit removal of the tires without damage to the uncured construction. It is rugged in design and made of the best grade alloy-steel and bronze, according to the manufacturers, in order to meet the high duty requirements of devices of this type. The mechanical design of the new drum arranges for the sections to be collapsed and withdrawn from the tire by power rotation of the building machine. The loose rings are removed from the bore of the end flanges, after which the collapsing operation proceeds. The illustration shows the drum in assembled position.

## Crane Colloidal Mixer

DESIGNED for the mixing and dispersing of pigment colors and clays, for reducing the viscosity of fluid mixtures, and to aid in the solution of solids, the Crane Colloidal Mixer is being distributed by the



Colloid Equipment Company, 50 Church Street, New York City. Applicable for rubber solutions or dispersions, this new unit consists of 15 notched discs which are assembled on a shaft at an angle of 18°, the discs being rotated in a cylinder at 1750 r.p.m. The angular setting of the discs, combined with the rotation of the shaft assembly, is said to give a longitudinal wiping action as well as a rotary action, which, combined with the high speed, causes great agitation of the material as it passes slowly through the cylinder. Easily installed, the desired material is fed into the hopper, where it passes through a 4-mesh screen, then passes through the cylinder of the unit, and emerges at either the front or side suiting the convenience of the operation involved. For a medium viscosity solution, the wide-open capacity of this new unit is 250 gallons per hour, the speed of passage being reduced by throttling the outlet where extremely fine dispersions are desired. Foaming is avoided since there is no suction in the mixer. A ½ h.p. motor runs the mixer, which weighs 125 pounds and is 40 inches long by 10 inches wide.

## Rubber Hardness Testing Machine

DEVELOPED at the request of the A.S.T.M. subcommittee on rubber testing, a new standard rubber hardness testing machine was recently introduced by the Tinius Olsen Testing Machine Company, of Philadelphia, designed to determine the hardness

of rubber by indentation, although it may also be used on other similar materials. This instrument is operated vertically, all loads being applied by weights, acting directly on the material being tested. Friction is said to be eliminated and no springs are used, assuring uniform and accurate loading throughout its range. Weights are supported directly on the penetrator, with weights of 1, 2, 3 and 4 pounds being changed to meet varying conditions and requirements. The hardness number, which is the penetration of the penetrator, is directly read from a dial at the top of the instrument. Different types of penetrators may be used, the setting and adjustment of the instrument for zero may be checked at any time during its operation, while various positions may be obtained by swinging it about the supporting post. This hardness tester is arranged so that it may be used on finished rubber tires or rubber blocks or pieces of varying shapes and

sizes. In testing tires, the penetrator protrudes through the base of the instrument to rest on the surface of the material to be tested. The instrument is supplied in a carrying case.

## Ideal Electric Marker

FOR marking on practically any material, including hard rubber, the Ideal Commutator Dresser Company, Sycamore, Illinois, has developed the Ideal

Electric Marker, a portable tool. The instrument, of 6¾-inch overall, weighs only two pounds, and is said to be as easily handled as a crayon or pencil. It requires no rheostats, or transformer, or auxiliary controls, makes permanent lines cut right into the surface of the material, while the point does not stick into the marking surface. The Ideal marker operates on 110 volt, 60 cycle A.C. and consumes approximately 75 watts.

## Fulscope Indicating Controller

FOR many processes where close throttling control is necessary but a record of the processing is not essential, the Taylor Instrument Companies, Rochester, N. Y., have introduced a new air-operated controller of the indicating type. Features of the new instrument, termed the Fulscope Indicating Controller, include either high range or full range sensitivity, as required; control point may be adjusted to any value within the control range; controller action may be quickly reversed in the field by altering a link position; there are many standard control ranges to choose from within the limits of minus 100° and plus 1200° F., or full vacuum and 3,000 pounds pressure; temperature controllers may be equipped with mercury-, vapor-, or gas-actuated tube systems; and a large scale with bold numerals and graduations which enables accurate observations from a distance. The new air-operated Fulscope indicating controller is available in both face and flush mounting styles.

# Book Reviews

**Tire Repair Stocks Accelerated with "Zenite" Combinations.** (Laboratory Report No. 169-A). Issued by the Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware. 6 pp.

Taking into consideration the various requirements with regard to tire repair stocks, this report offers two suggested tread compounds, a formula for coat repair gum, and two formulas for cushion repair gum. All of these compounds incorporate Zenite, the accelerator produced by the Rubber Chemicals Division of du Pont. Of the two tread compounds, one represents the average type stock for use in a shop curing at 40 pounds steam pressure, while the other is a very fast curing stock suitable for vulcanization at 25 pounds steam pressure. The physical results of the cures of these formulas, as well as the other three in the report, over a range of time and temperature, are also given. The tests on the tread compounds indicated that the tensiles of the stocks hold up over a long period of time, which allows the tire retreader considerable leeway in the curing of his tires.

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**Seedine.** (Bulletin No. 104). Woburn Degreasing Company of N. J., Harrison, N. J. 5 pp.

This bulletin, one of a series currently being distributed by Woburn Degreasing, discusses the advantages of Seedine over stearic and other fatty acids in rubber compounding. Seedine is described as "a combination of fatty acids from animal and vegetable oils" which is used as a replacement for the materials mentioned. The advantages of this material in tire stocks, heel and sole stocks, wire insulation, dry heat cures, hard rubber and mechanical rubber goods are described, with one or two tests included showing a comparison of Seedine and stearic acid in certain stocks. Also recommended is Woburn No. 8 Oil as a plasticizer in rubber goods, with a break-down showing the specifications of the oil.

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**Inflation.** By Leonard P. Ayres. Published by the Cleveland Trust Company, Cleveland, Ohio. 36 pp.

Describing a period of inflation as "an artificially stimulated business boom with a specialized kind of bad ending", Col. Ayres, in this booklet, distributed by the bank of which he is vice-president, explains the causes and results of previous inflationary periods in the United States and foreign countries. Admitting that some type of inflation is inevitable, the author claims that a long process of price inflation, discussed in the booklet, does not appear to be a probable development in 1936, 1937 or even 1938.

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**Instruments for Spectrographic Analysis.** Issued by the Bausch and Lomb Optical Co., Rochester, N. Y. 32 pp.

Offered for the information of both experienced physicists, chemists and research workers, as well as tyros in the field of analysis and research, this catalog (D-20) includes a chapter on spectrography in the analytical laboratory which indicates, in a general way, what the spectrographic instruments are, how they are to be used, and the kind of results that may be expected from them. Various instruments for spectrographic use are described and illustrated.

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**Tag Phototube Pyrometers.** C. J. Tagliabue Mfg. Company, Park and Nostrand Avenues, Brooklyn, N. Y.

This catalog (1101B) describes in detail the features of the line of Tag indicating, recording and controlling pyrometers manufactured by the company, which utilize a beam of light, a mirror galvanometer and a phototube. This construction is said to offer instantaneous action, accuracy of 0.1%, and high sensitivity. Interior illustrations of the various models available are clearly marked in the catalog, giving a quick understanding of the operation of each type.

# Editorial Comment

## Avoid a Price War

FOR the first time in a decade tire prices have remained stabilized over a period of eight months or more. Since last November, when the stabilization program was put into effect, little has arisen to disrupt the price situation. The industry took the 10% average increase in prices announced on May 4 in stride without a break in the situation, with the mail order houses following suit by also raising prices. With a 10% increase in original tire equipment prices just put into effect, tire manufacturers are in an excellent position to earn substantial incomes this year.

Until recently, the mail order houses, the gas station distributors, and the tire manufacturers maintained cordial relationships. No individual group launched any sales program which would disrupt that harmony. Now, however, a fly appears in the ointment in the form of an insurance policy currently being offered by Sears-Roebuck to purchasers of its better grade tires. At present this offer is restricted to Illinois; if this works it will be widened to embrace other states in which such premiums are permitted; and if expanded to other states there is every likelihood that the stabilization record will be broken.

Tire manufacturers should do everything in their power to avoid another price war, but what they can do in respect to such sales programs as that inaugurated by Sears-Roebuck is a problem. A price war at this time, however, would prove most disastrous to the recovery stride now in progress, and should be avoided at any cost.

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## Progress Continues

ON every side there are indications of continued improvement in the rubber industry. These are found in financial statements, surveys, expansion program announcements, and in still other forms. While the cost of raw materials and labor in 1936 is higher than that of previous years, rubber manufacturers, for the most part, have absorbed it in their progressive stride.

The periodical Dun and Bradstreet survey of conditions in all branches of the rubber industry, just issued, points out that production and sales gains have been recorded in the first five months of 1936 in comparison with the corresponding 1935 period in every branch of the trade, except tires. These gains ranged from 8 to 20%. Even the tire industry, which lagged behind in production by 6.8%, actually improved its position by means of a 17.8% reduction in its inventory.

One definite indication of the pick-up in the industry is to be seen in the crude rubber consumption figures. Total consumption for the first five months of the current year amounted to 230,334 long tons, a new all-time high for that period, which was 5.5% above the 218,258 tons consumed in the 1935 period. In comparison with other previous years the percentage gain was still larger.

Another encouraging sign is the renewed building programs launched by many rubber manufacturers. For instance: Dayton Rubber is adding a second story to its office building; Paragon Rubber was forced to move from Brooklyn, N. Y., to Easthampton, Mass., because of a need for more production capacity; Inland Manufacturing Company is spending $750,000 to provide 175,000 additional square feet of floor space; Swan Rubber is building a 50-foot brick addition to its factory; several other companies are in the midst of similar activities.

The financial statements, too, are heartening. As an example there is Firestone's report for its last six-month period during which earnings were 75% above those of the corresponding period in the previous fiscal year. According to all indications, this company will end its present year with profits almost double those of 1935.

There no longer can be any doubt that the rubber industry is definitely on its way to profitable operations once again.

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## American Rubber

THE attempt to establish sources close to home for cultivating rubber continues apace, led by Goodyear. Based on its experiments with rubber cultivation in Panama, Goodyear has negotiated and secured 1,000 acres in Costa Rica. It is unfortunate that the territorial restrictions of such territories as Costa Rica, Panama, the Philippine Islands, and other logical sources for the cultivation of rubber limit the activities of any one company to only 1,000 acres of land.

Naturally, the effort to plant and cultivate rubber trees in territories as close as possible to the United States, because of the tremendous investment required over a period of at least seven years, must be left to the larger rubber companies. Until acreage restrictions are lifted any one company cannot hope to produce anywhere near its annual requirements on plantations developed in such spots, but the trees cultivated will probably yield an exceptionally high grade rubber because of the fact that in back of their planting lies the accumulated knowledge of cultivation in practically all rubber growing centers.

At Costa Rica, for instance, Goodyear is planting carefully nurtured seeds which, when in full bloom, are expected to yield several times the amount of rubber secured from the ordinary variety.

CURRENT • NEWS
of the Rubber Industry

JULY, 1936

# Rubber Industry Survey Reveals Gains In Practically Every Trade Division

## *Production and Sales Gains Ranging Up to 20% in First Five Months of Current Year Over Similar Period of 1935 Shown by Dun & Bradstreet Survey*

PRACTICALLY every division of the rubber industry is showing improvement over the early half of 1935, according to the latest periodical survey made by Dun and Bradstreet, Inc. The substantial recovery which occurred during the last half of 1935 has made further progress in the first five or six months of the present year. Wholesalers of mechanical rubber goods, belting, packing and specialties booked orders thus far in 1936 that were 15 to 20% above those in the corresponding period last year. Retail sales of sundries and novelties are reported at 10 to 12% higher, with rubber footwear increases running up to 20%, carry-overs being negligible.

Production in all rubber manufactures during the 1936 period covered by the survey advanced 8 to 20% from the 1935 comparatives with the exception of the automobile tire division. The position of the latter, however, has been improved despite a 6.8% drop in production by a 17.8% reduction in inventory.

### *All-Time Consumption Record*

The expanding activity of the industry during the first half of this year was indicated by consumption figures for crude rubber during April which set an all-time record. The tire price situation has also been considerably improved in comparison with 1935, with one rise averaging 10% going into effect last May and a second one in the offing.

Unfortunately, despite the widening distribution, rising costs of raw materials and increased wage benefits to workers prevented several rubber manufacturers from showing a betterment in earnings this year, although actually increased sales were reported.

Production of tires in the first three months of 1936 was smaller than that recorded in the same period a year ago. In April, however, output rose to 4,854,000 units, exceeding the March total by 33.4% and that of April, 1935, by 7.6%. Despite this increase, however, production for the first four months of the year amounted to only 16,648,000 tires, which was 6.8% less than the 17,867,000 units produced in the 1935 period and 7% under the 1934 period which amounted to 17,907,000 units.

This decrease, however, was not altogether unexpected in the trade since gains in the last half of 1935 brought the total output for that year up to 49,362,000 units, the largest annual output since 1930, and a 4.5% increase over 1934.

Total crude rubber consumption for the first five months of 1936 amounted to 230,334 long tons, a new high for that period of time. It was 5.5% above the 1935 comparative of 218,258 tons, and 7.4% higher than the first five month period of 1934. The corresponding 1933 and 1932 totals were exceeded by 75.1% and 54.1%, respectively. This gain extended the rise of 1935 and indicates that consumption for the year of 1936 will establish a new record. Although world rubber consumption has not kept pace with American consumption, it is probable, according to the survey, that world stocks will be depleted by approximately 100,000 tons by the end of the year.

### *More Advantageous Prices Set*

With regard to price structures, the survey points out that in addition to the tire increase on May 1, the first since November, 1934, and which actually restored list prices rather than raised prices, rubber footwear, raincoats, galoshes and sundries are 8 to 10% higher at present than they were at the beginning of the year.

Although failures in the rubber manufacturing industry during 1935 were the fewest ever recorded in any twelve-month period, the reduced levels were maintained in the first five months of 1936. Only 2 bankruptcies occurred during that period, which compares with 5 in the entire year of 1935. The liabilities involved in these two failures, however, amounted to $616,000, which exceeded the total for any full year back to 1932 when 14 failures were recorded at an aggregate amount of $923,883. One of the two manufacturers involved in the present period had a total indebtedness of $606,600.

These statistics of commercial failures reported by Dun and Bradstreet are exclusive of applications under Section 77B of the National Bankruptcy Act which became effective in June of 1934. However, since this law became effective only two manufacturers in the rubber industry filed reorganization applications under its terms with no record of any applications filed by any wholesaler or retailer.

The most remarkable gain in any division of the industry was in the rubber footwear division, with a 20% gain reported and an excellent inventory position. This gain was in part attributed to stock depletion during the severe weather last Winter and to the Spring floods this year.

### *Spot Rubber at 1929 Levels*

For the month of April the average spot quotation on standard ribbed smoked sheets at New York was 15.98 cents per pound, the highest level reached since 1929 when the annual average reached 20.55 cents. The April average price compares with 11.55 cents in April, 1935, and 12.10 cents in the same month of 1934. In comparison with the 3.56 cents average in April, 1933, this year's quotation was 348.9% higher and 417.1% higher than the 3.09 cents average in April, 1932.

### Import Values Decline

Crude rubber, including latex, imported into the United States for the January-March, 1936, period, amounted in value to $29,112,000. This is 18.6% less than the $35,767,000 reported for the same period in the preceding year, according to figures compiled by the Foreign Commerce Department of the Chamber of Commerce of the United States. Crude rubber represented 5.1% of the total value of all materials imported into the United States during 1935.

## SUE THERMOID OVER BREACH OF CONTRACT

Alleging breach of contract, the Triplewear Brake Lining Corporation, of Paterson, N. J., has filed suit against the Thermoid Company, of Trenton, asking $150,000 in damages. The suit was also filed in the name of Norman E. Heil and William H. Heil, general manager and chief engineer, respectively, of Triplewear.

According to the petition, the defendant corporation has not carried out the terms of the contract entered into last December which provided for the purchase of Triplewear's assets by Thermoid. Included in the assets were 18 patents, several secret processes (including one covering a new method of manufacturing rubber thread), customer lists and good will, all of which, it is alleged, were turned over to Thermoid.

The petition also cites the fact that due to the agreement entered into between the two parties, the Triplewear plant was dismantled to such an extent that it cannot be used to carry on business, while a number of officials and employes who were discharged or resigned are not available to the company to continue operations. It is also alleged that the value of shares held by the co-plaintiffs has declined considerably and that they have not been paid $13,411 due to them from the corporate plaintiff.

All charges have been denied by the Thermoid concern which claims that the total price for the assets of Triplewear was figured at approximately $35,000. The suit will be heard in the near future in Mercer Supreme Court, at Trenton.

## GROUND WALNUT SHELL USED IN HARD RUBBER

After several months of extensive research, chemists of the California Walnut Growers Association, a cooperative organization of Los Angeles, have concluded tests indicating that finely ground walnut shells may be used successfully as a compounding ingredient in hard rubber.

Experiments conducted by the Santa Fe Rubber Mills, Inc., of Los Angeles, in cooperation with the Association, have resulted in the production of rubber doors, door jambs and casings for electric refrigerators made from compounds containing ground walnut shells. A leading commercial refrigerator manufacturer in California is already merchandising refrigerators equipped with these rubber parts.

It is reported that hard rubber compounded with the ground shells does not impart any foreign flavor to the food contents of refrigerators, the chemical properties of the shells serving to eliminate the sulfur-dioxide formation which is said to be formed by the usual hard rubber trim on refrigerators. In addition to the insulating qualities of these rubber doors they are also said to take on a high polish merely from rubbing; can be easily colored, the shells taking readily to pigments; and have other advantages over refrigerator doors made of other materials.

Because walnut shells are exceedingly hard, special equipment had to be devised for grinding them. They are ground in various degrees of fineness depending on the use to which they are to be put, the size for hard rubber compounding being 325 mesh. The particles in this mesh are much larger than those of carbon black and are visible as individual particles through microscopes, yet they are claimed to be sufficiently fine to make a hard rubber suitable for various purposes. Hard rubber compounded with ground walnut shells is also being used in the manufacture of battery boxes, battery box covers, etc., at the present time.

There is a plentiful supply of walnut shells available since the walnut growers group has 5,000 to 6,000 tons of shells to dispose of each year. Its technical division is continually experimenting to discover new outlets for this by-product, the rubber investigations being part of this program. The Association is continuing its experiments in this connection with several rubber manufacturers in the Los Angeles area.

## Coming Events

**July 25.** Fishing excursion, Los Angeles Group, Rubber Division, A.C.S. San Diego, Calif.

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**September 10-11.** Rubber Division, A.C.S. William Penn Hotel, Pittsburgh, Penna.

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**October 6.** Los Angeles Group, Rubber Division, A.C.S. Los Angeles, Calif.

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**October 6-7.** Rubber Section, National Safety Council. Atlantic City, N. J.

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**April 12-15, 1937.** Rubber Division, A.C.S. Chapel Hill, North Carolina.

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**September 13-17, 1937.** Rubber Division, A.C.S. Rochester, N. Y.

### Overman Wins Patent Suit

The Goodyear Tire and Rubber Company was ordered to pay $476,275 to the Overman Cushion Tire Company by Federal Judge Paul Jones, of Cleveland, on July 2. The award was based on a suit brought by Overman on July 1, 1935, alleging that Goodyear had violated patent rights on a truck tire which contained a hole through the center but was not inflated. Overman contended that it had licensed Kelly-Springfield to manufacture these truck tires, but that Goodyear had no license. The award was in the form of damages. Goodyear will probably appeal the verdict.

## REQUEST REFEREE IN GOODRICH STOCK SUIT

An immediate trial before a referee to consider the validity of a certificate which declares that stockholders have authorized directors to mortgage its assets for $45,000,000, the first step in a refinancing program, was applied for before Justice Church of the New York Supreme Court on June 22 by the B. F. Goodrich Company. A decision is expected in the next few weeks.

The validity of the stockholders' approval has been challenged by Otis and Company, brokerage house, also stockholders, on the ground that proxies for 446,490 shares held by Goodrich were not legally voted.

Goodrich filed suit in the New York courts several months ago to secure a legal decision on the validity of the certificate approved at a meeting of stockholders called for the express purpose of approving the refinancing program, rather than to have the program halted temporarily after its initiation by law suits alleging that the program was not legally approved.

### Raise Original Tire Prices

Effective as of July 1, tire manufacturers raised prices on tires used as original equipment on automobiles by 10%. The advance, which is the first in two years, was announced one week prior to its effective date which is the period of the year when most contracts for original equipment with automobile manufacturers come up for renewal. Because replacement demands have fallen short of expectations, due to the lack of warm weather for the most part, the general advance expected early in July will probably not be put into effect.

### Akron Labor Quiet

Although a group of organizers sent down to Gadsden, Alabama, for the express purpose of organizing the Goodyear workers in that city were driven out of town by an angry mob on June 25, there has been no repercussion at the Akron factories. The Government has launched an investigation into the Gadsden affair, prompted by union charges that Goodyear officials incited the trouble. Sitdowns continue to occur in both the Goodyear and Goodrich factories but serious trouble has been thus far avoided. While labor is still seething, few outbreaks took place last month.

### Introduces "Wyex" Black

A new carbon black, said to be the result of extensive research with a Wyoming natural gas and for which a special method of production was developed, has been introduced by J. M. Huber, Inc., New York City. Termed "Wyex," the new black is at present being introduced in limited quantities and is said to be especially suitable in special compounds designed for tough service, such as tire-mileage contracts.

## COL. SPEAKS HEADS FISK RUBBER CORP.

Col. Charles E. Speaks, identified with Firestone activities since 1913, was named president of the Fisk Rubber Corporation, Chicopee Falls, Mass., last month, succeeding Edward D. Levy, resigned. According to report, Mr. Levy resigned to accept another post but no information is available as to any such

Col. Charles E. Speaks

connection at present. The newly-elected president has a record of twenty-three years of experience covering all phases of rubber manufacturing and merchandising.

Starting with Firestone in 1913 as manager of the Cycle Tire Department, Col. Speaks, with the exception of a brief period during the war, has been associated with that company. From 1915 to 1917 he acted as manager of the Truck and Bus Tire Department; he was in the Transport Division of the U. S. Army in France during the 1917-19 period, during which time he received two citations, the D.S.M. and French Officer of the Academy of Beaux Arts with Silver Palm.

In 1919 and 1920, Col Speaks was manager of the Firestone Government Department; from 1920 to 1926 he was European Export Manager with headquarters in London; in the 1927-32 period he was vice-president and general manager of the Firestone Footwear Company, at Hudson, Mass., and president of that affiliate from 1932 to 1935, in the latter half of which year he resigned that post prior to the sale of the company to U. S. Rubber Products, Inc.

Born in Washington, D. C., in 1888, Col. Speaks was graduated from the Business High School in that city in 1905. In 1921 he was married to Dr. Tatiana Tarasoff, a graduate of the College of Medicine, in France. Because of his work with Firestone he resided in Akron for a number of years, but considers himself an adopted son of New England, having lived in that section of the country since 1927. At present he makes his home in West Newton (Mass.), but expects to remove to Springfield shortly. His principal recreation is fishing, although he does not include that sport among his hobbies which he states are "my home, my wife, my garden and my work."

In commenting upon his election to the presidency of Fisk, Col. Speaks lauded the past record of the company, described its financial structure as sound, and predicted that it would soon again "take its place as one of the outstanding companies in the industry." He plans no changes in the Fisk personnel, stating that in his short reign as president he feels that he has "inherited a capable, industrious, hard-working group, all of whom have shown an extremely cooperative spirit."

## AKRON TIRE PLANTS MAINTAINING PACE

Despite frequent sit-downs and labor flare-ups, tire factories in and around Akron are reported to be producing more than 110,000 tires per day, the object being to build up depleted inventories as much as possible. In addition to this factor, continued demands from the automobile manufacturers for original equipment tires are increasing with the prospect in view that peak production of tires may continue through the Summer and with the possibility that factory vacations may be cancelled or delayed.

According to reports from Akron, however, the rubber manufacturers are continuing their decentralization moves. Goodyear, it is understood, has leased extensive warehouse facilities in Detroit where it is storing thousands of tires, in addition to which the company has shifted a considerable amount of tire building machinery to its factories at Los Angeles, Cumberland (Maryland), and Gadsden (Alabama). Both Goodrich and Firestone are also understood to have shipped tire building apparatus to their respective California factories.

U. S. Rubber, which has not encountered any serious labor troubles to date, is planning to increase the capacity of its Los Angeles subsidiary, the Sampson Tire and Rubber Company, from 5,000 to 7,000 units a day.

### Settle Boston Hose Strike

A forty-three hour strike at the Boston Woven Hose and Rubber Company plant at Cambridge, Mass., on June 24 and 25, was quickly settled, with no violence marking the negotiations. The union demanded a 10% increase in pay, 100% Bedaux bonus, vacations with pay, and a closed shop. In settling the strike, the management conceded none of these demands, granting only time and half for overtime instead of time and a third in addition to a few other very minor concessions.

## ARMSTRONG CORK BUYS STEDMAN RUBBER CO.

The Armstrong Cork Company, manufacturer of a complete line of linoleum and other types of floor coverings, of Lancaster, Pennsylvania, has acquired the plant and assets of the Stedman Rubber Flooring Company, South Braintree, Mass. The purchase, which at this writing requires the ironing out of a few minor details before being completely consummated, was approved by Stedman stockholders at a special meeting late last month.

According to Armstrong officials, the company's tile business has been expanding rapidly with the result that additional production capacity was necessary which led to negotiations with the Stedman concern. Acquisition of the latter company rounds out the Armstrong manufacturing operations. H. R. Peck, of the Armstrong Building Materials Division, is in charge of rubber tile activities.

The Stedman company was organized in 1909 and entered the rubber tile field in 1920 earning a position of leadership in that field within a few years. The widespread use of rubber tile in the general flooring field contributed to Stedman's progress. According to present plans, Armstrong will continue to operate the Stedman plant at South Braintree with few changes in the Stedman personnel.

## RUBBER CONCESSION GRANTED TO GOODYEAR

Based on its planting experiment in Panama, which is reported to have proved successful, the Goodyear Tire and Rubber Company sought and obtained a concession for a large plantation for the cultivation of rubber in Costa Rica. It is believed that the concession was obtained partially through the efforts of the American Legation in San Jose.

Under the terms of the contract entered into between Goodyear's plantation subsidiary and the Costa Rican Government, Goodyear will plant 1,000 acres of seedlings this year and will deliver to the Government 500 each of three different types of tires each year during the 20 year term of the contract, in exchange for which Goodyear will have free import and export rights and enjoy concessions of taxes.

Clearing and planting on the tract set aside for Goodyear has already been started. The type of rubber tree being planted is said to be one that will yield several times the amount of rubber secured from the ordinary variety. The new plantation, however, is intended only for experimental purposes.

It is interesting to note that both of the Central American plantation experiments pioneered by Goodyear are on land which had been previously used for bananas but which had been abandoned for a number of years.

## NEW YORK OUTING DRAWS RECORD CROWD

A record crowd, more than 350 members and guests, turned out for the Third Annual Outing of the New York Group, Rubber Division, A.C.S., held on June 13, at the Alps Castle, in Preakness (Paterson), N. J. Although rain threatened throughout the day, it held off until almost the last event was completed.

The featured event of the outing—the soft ball tournament—was won by the Overman Tire team which defeated the DuPont team decisively thereby gaining possession of the *India Rubber World* cup until the next outing. The cup had been in DuPont's possession. C. L. Smith (Naugatuck) was in charge of this event.

Including an unusually large number of participants, the golf tournament, under the direction of F. E. Traflet (Pequanoc), resulted in a spirited contest with the cup especially donated for the day by the United Carbon Company going to Rodney G. Brown, of U. S. Rubber, who turned in a low gross of 76. Wm. H. King, (Pocono) won the Kickers Handicap, while several other prizes were awarded including one for Low Team Score which went to the Habirshaw Cable group.

Richard Opper (U. S. Rubber) won first prize in the tennis tournament, played on exceptionally poor grounds, with M. B. Jones (Vanderbilt) the runner-up. Due to unavoidable delay Don Comes (Farrel-Birmingham) did not arrive in time to manage the tournament and M. E. Lerner (THE RUBBER AGE) took over.

William Lamella, of Okonite, duplicated his victory of last year in the horseshoe pitching contest, with Mr. Rogers, of the same company, finishing in the runner-up position. This event was under the direction of D. C. McRoberts (*India Rubber World*).

In addition to the sport contests, three lively boxing bouts were put on in the afternoon. This card was arranged by W. W. Higgins (United Carbon) who also acted as general announcer for the respective events.

W. C. Lingvall, of the U. S. Rubber Development Department, Passaic, N. J., was chairman of the outing, while J. Miscall, of the Flintkote Company, acted as master of ceremonies, both being assisted by a corps of rubber executives from various companies. Despite the inclement weather the outing was adjudged satisfactory on all accounts, although it is probable that a location with greater facilities will be selected for future outings.

The companies contributing cash and prizes for the various sports events, as well as lucky number drawings, included the following: Binney and Smith Co., Container Co., E. I. du Pont de Nemours and Co., Farrel-Birmingham Co., Inc., Flintkote Co., General Atlas Carbon Co., *India Rubber World*, Naugatuck Chemical, N. J. Zinc Co., THE RUBBER AGE, Seamless Rubber Co., Southeastern Clay Co., Stamford Rubber Supply Co., United Carbon Co., R. T. Vanderbilt Co., and Vansul, Inc.

## LOS ANGELES GROUP PLANS TWO OUTINGS

Two outings for the month of July were planned by the Los Angeles Group, Rubber Division, A. C. S. A golf tournament was scheduled to be held on Saturday, July 11, at the Montebello Golf Club, on Beverly Boulevard in Los Angeles, with indications at this writing of an excellent turn-out. In addition to the regular cup prize, the players were to compete for the blind bogey. The committee in charge of the golf tournament consisted of H. H. Hummer and M. Montgomery.

The second event for the month is the annual fishing trip under the supervision of Edward Royal, of the H. M. Royal Company. This calls for an all-day event out of San Diego on Saturday, July 25. By July 3 there were already sufficient reservations to assure full capacity loads for two fishing barges. Approximately thirty-four fishermen are expected to make the trip. This fishing excursion is scheduled as an annual Summer affair, many of the rubber men, including Mr. Royal, being deep sea fishing enthusiasts.

### Safetex Company Busy

The Safetex Company, Inc., of 12 West 21 Street, in New York City, reports exceptional activity on its various lines of manufacture. The company, of which Raymond Healy is president, specializes in the production of a varied line of latex dipped and sprayed articles, including fishermen's garments, and has been at its present location for approximately two years. Mr. Healy, developer of the Safetex Process, which incorporates a latex base, was formerly the head of the Rodic Rubber Corporation, at Garwood, N. J., which was purchased by Remington-Rand some two years ago. The company made rubber platens and rollers. In addition to producing its own line of goods, the Safetex concern also is serving a number of companies on both private brand items and in coating certain parts of their products with latex. It is equipped to apply coatings by the spray, brush and dipping methods. Raymond P. Morse, until recently president of the Cantilever Shoe Company, recently joined Safetex in an executive capacity. The company is also reported to be experimenting with synthetic rubber latex.

**Members and guests at the dinner which climaxed the Third Annual Outing of the New York Rubber Group at Alps Castle on June 13.**

## AKRON RUBBER GROUP HOLDS ANNUAL OUTING

Approximately 250 members and guests attended the annual outing of the Akron Group, Rubber Division, A.C.S., held at the Silver Lake Country Club on June 26. The featured event of the afternoon was a golf tournament, favored by perfect weather, with H. Bainbridge winning the award for the longest drive off the 1st tee, while M. J. Derbel made the best drive off the 17th tee. Seven other prizes were awarded for various feats of prowess during the tournament, including one by C. Hahn for the longest drive with a putter.

By means of a loud speaker arrangement, V. L. Smithers and Bert Taylor deviled the golf players throughout the tournament, effectively giving "instructions" to the golfers on proper stance, selection of clubs, etc., as well as directing their attention to the hazards which confronted them. Also adding to the festivities of the afternoon was a German band which rendered appropriate airs to the complete satisfaction of the large crowd, according to report.

Dinner was served at the conclusion of the sports events arranged for the eating during which approximately eighty members and guests were awarded a wide variety of prizes. The prizes were donated by the following companies:

Adamson Machine Co., Akron Chemical Co., Akron Rubber Group, American Cyanamid and Chemical Co., American Zinc Sales, Anaconda Zinc Oxide, Anderson-Pritchard Oil Co., Barnwell and Co., Binney and Smith Co., Godfrey L. Cabot, Inc., Canfield Oil Co., Cannon Mills, Columbia Alkali Co., Poncet Davis, Dill Mfg. Co., Dugan-Campbell and Co., E. I. du Pont de Nemours & Co., Farrel-Birmingham Co., Forbes Varnish Co., General Atlas Carbon Co., C. P. Hall, Herron and Meyer, J. M. Huber, Inc., and Imperial Oil and Gas Products Co.

Midwest Rubber Reclaiming Co., H. Muehlstein and Co., National Rubber Machinery Co., National Standard, Naugatuck Chemical, N. J. Zinc Co., Philadelphia Rubber Works, Rubber Service Laboratories, A. Schrader and Son, St. Joseph Lead Co., Henry L. Scott Co., A. Schulman, Inc., Superior Zinc Co., Stauffer Chemical Co., Turner Halsey Co., United Carbon Co., R. T. Vanderbilt Co., Wellington Sears Co., Western Shade Cloth Co., C. K. Williams and Co., Charles T. Wilson and Co., Wishnick-Tumpeer, Inc., Wyandotte Oil and Fat Co., and the Xylos Rubber Company.

**Members and guests snapped at the Akron outing at the Silver Lake Country Club on June 26, reading from left to right: (1) N. Johnston, R. W. McCullough, J. E. Whittenberg, R. F. Dunbrook; (2) J. B. Barr, Cody Ressiger, D. M. Welch, H. S. Stoller; (3) C. B. Greenlese, N. A. Weyand, J. C. Blue, R. M. McCann; (4) V. H. Orr, N. S. Worrall, H. J. Conroy; (5) M. J. Deibel, C. B. Hudson, N. A. Boyle, F. C. Haas; (6) E. V. Baldwin, C. R. Haynes, R. T. LaPorte, and L. F. Michelson. (Photos by Allyn K. Thayer).**

**Upper left: Officers of the Akron Rubber Group, reading from left to right, G. L. Allison (Goodrich), vice-chairman; Enos Baker (Binney & Smith), chairman; A. E. Warner (C. P. Hall), secretary-treasurer. Upper right: Bert Taylor at the microphone on the 18th green giving "instructions" to the golfers, while Harry Schrank, of Seiberling, and V. L. Smithers are looking on in the background. Lower left: Reading from left to right, Dan Webster (Denman), Ferd Bonstedt (Binney & Smith), John Herron (Herron and Meyer), and Bill Whittaker confer at the 19th hole. Lower right: Jack Moore, of Goodrich, serenading with the tuba. (Photos by Allyn K. Thayer).**

## Urge Rubber Tray Demand

In a national advertising campaign now under way, the Inland Division of the General Motors Corporation, Dayton, Ohio, is urging prospective purchasers of electric refrigerators to demand flexible rubber trays or grids in the models they select. Advertising copy is stressing the protection given the ice cube during removal from rubber trays as compared with removal from ordinary all-metal trays. The Inland Division pioneered rubber trays in electric refrigerators several years ago.

# NEW ENGLAND NEWS

The rate of taxation on machinery used for manufacturing purposes has been made uniform throughout Massachusetts through a law enacted in June by the Legislature. It provides a rate of $5 per $1,000, as contrasted with the previous law under which machinery was taxed at the local rate, which in some instances amounted to as much as $40 per $1,000 .

In signing the bill, Governor Curley said the law will make possible retention of industries now in the state, and may induce others to locate in Massachusetts. He termed it courageous and aggressive legislation, meeting "the sniping competition which we have encountered for years," and said it would increase employment and thus reduce relief costs and stimulate business. The bill was supported by both labor and industry, the governor pointed out.

Most rubber manufacturers in the state will gain by the move, it is believed, as tax rates vary widely in various communities and the levy on machinery in most cases has been considerably more than the new rate.

A brick addition, 29 x 57 feet, is being erected by U. S. Rubber Products, Inc., at its plant in Naugatuck, Conn. Construction work is well under way.

John P. Coe, former factory manager of the Naugatuck Chemical Division of U. S. Rubber Products, Inc., at Naugatuck, who was recently placed in charge of all Naugatuck sales, and transferred to the New York division, was honored by 700 employes at the annual outing of the Alembic Association, held at Camps Irving and Pershing on the Housatonic River. Mr. Coe, one of the organizers of the association, was presented a plaque, the presentation being made by Edward Reilly, industrial relations manager.

A preliminary certificate of dissolution has been filed for the Armstrong Tire Sales Company, West Haven, Conn., subsidiary of the Armstrong Rubber Company, in the same town, which manufactures tires and batteries. Claims against the sales affiliate are being received by the Armstrong Rubber Co.

## Changes Corporate Name

The name of the Canadian Goodrich Company, Ltd., Canadian subsidiary of the B. F. Goodrich Company, with factories and offices at Kitchener, Ontario, has been changed to that of the B. F. Goodrich Rubber Company of Canada, Ltd. According to F. G. Morley, vice-president and general manager of the Canadian plant, the change was made to associate the subsidiary more closely with the parent company, to give a clear impression of the types of products manufactured and to have the firm listed in telephone directories and other sources of information under "Goodrich" rather than "Canadian."

## Synthetic Rubber Laboratory

A special laboratory for the synthetic rubber experiments of the Pirelli Company has been established in Milan, Italy. Tires and other products made from the synthetic rubber produced by this laboratory are said to equal similar products made from natural rubber. An exhibit of the Pirelli synthetic rubber products is planned for the early future.

## Franklin in Philadelphia

The Franklin Rubber Corporation, formerly of Doylestown, Pennsylvania, is now located in a new factory at Allegheny and Boudinot Streets, in Philadelphia, where larger quarters have been provided for the manufacture of plumbers' rubber sundries, bath sprays, and other products featured by the company. The new factory has four times the capacity of the Doylestown plant and is reported to be operating in two shifts. The newest type of equipment was recently installed. M. Durst is president of the Franklin concern.

## Begin Study of Silicosis

The Department of Health, the Cornell University Medical College, the New York Hospital, and the New York Tuberculosis and Health Association, all of New York City, have jointly undertaken an extensive and scientific study of silicosis, the study being made possible by the appropriation of $91,944 from the Works Progress Administration. Approximately 3,000 workers employed in industries in which a silicosis hazard exists will be examined during the course of the study.

## ARGENTINE SUPPLIES DOMESTIC DEMAND

Due to substantial increases in production from its own rubber manufacturing industry, Argentine is now supplying its domestic demand almost solely from local factories. About 85% of tires and tubes required are manufactured in the country, 90% of the canvas rubber-soled footwear, and a large portion of the rubber heels and soles, hose, tubing, machinery packing and belting.

Domestic production of the four largest rubber manufacturers in Argentina, according to figures supplied the Leather and Rubber Division of the Department of Commerce by Assistant Trade Commissioner J. D. Walstrom, stationed at Buenos Aires, was reported as follows in recent years: tires, 251,825 units in 1933 and 435,610 units in 1934; tubes, 369,315 units in 1933 and 688,786 units in 1934; rubber heels, 1,688,436 pairs in 1933 and 2,849,450 pairs in 1934. These figures are not complete for the country since they do not include the production of other rubber manufacturers. The four largest companies employed 1,633 persons in 1934.

# TRENTON NEWS

The Tyson Corporation, 17 Academy Street, Newark, has been incorporated at Trenton, with 1,000 shares of no par value, to manufacture various kinds of rubber products. The incorporators are Thomas H. Tyson, Railroad Place, Woodbridge, N. J., and Nathan Davis and George Buermann, both of Newark.

The United States Government has leased a part of the former plant of the Ajax Rubber Company, in Trenton, as a unit for the Civilian Conservation Corps.

John T. Maloney, 44, of Morrisville, a foreman for the Essex Rubber Company, of Trenton, was fatally stricken with a heart attack on June 13. Burial was at Morrisville, Penna.

The Hohwieler Rubber Company, Morrisville, Penna., has installed a gasoline and oil unit to take the place of the electrical equipment heretofore used to operate their mixing mills. The company now operates both a day and a night shift.

INTERNATIONAL PULP CO., *41 Park Row, New York, N.Y.*
SOLE PRODUCERS OF PURE **ASBESTINE** SPECIALLY PREPARED FOR USE IN RUBBER
Covered and Protected by Letters Patent Registered at U. S. Patent Office, Washington, D. C.
LIBERAL WORKING SAMPLE FURNISHED FREE

# Names in the News

T. NEIL WILDER, for the last several years assistant to Carl J. Wright, vice-president of General Atlas Carbon Company, New York City, has resigned to accept a position with the advertising department of the Jones and Laughlin Steel Corporation, Pittsburgh, manufacturers of light oil distillates including benzol, toluol, naphthas and xylol, as well as structural steel pipe, boiler tubes and other steel products.

S. M. MERCIER, for many years identified with sales, engineering and construction of conveying systems for the Jeffry Mfg. Company, Columbus, Ohio, has joined the sales and engineering department of the Boston Woven Hose and Rubber Company, Cambridge, Mass.

GEORGE OENSLAGER, of the Goodrich research laboratories, attended the Chemical Engineering Congress in London, England, which started on June 22, also attending the joint meeting of the American Institute of Chemical Engineers and the British Institution of Chemical Engineers which opened on June 28.

ERIC A. NEWMAN, chief engineer, Pocono Company, Trenton, N. J., has been made treasurer of the N. J. State Association of Power Engineers. He is a past president of that organization.

J. C. GIBSON, president, Pioneer Rubber Company, Willard, Ohio, which furnished the surgeons' gloves for the last Byrd Expedition, was a guest at the recent testimonial dinner given Commander Byrd in New York City.

RUSSELL W. CASE, JR., has been advanced to the post of advertising manager of the Thermoid Company, Trenton, N. J., succeeding E. V. Carlquist who resigned to become associated with Fuller, Smith and Ross, Cleveland advertising agency.

HERBERT A. DERRY, associated with the United States Rubber Company for more than 21 years, the last 10 of which were spent as sales manager of the shoe products division, has been appointed general manager of the Lima Cord Sole and Heel Company, Lima, Ohio.

H. E. VAN PETTEN, advertising manager, mechanical goods division, B. F. Goodrich Company, Akron, has been elected vice-president of the Industrial Marketers of Cleveland, a unit of the National Industrial Advertisers Association.

CHARLES S. POWELL, with the Firestone research laboratories for the last 7 years, has joined the laboratories of the Revertex Corporation of America, Bush Terminal, Brooklyn, N. Y.

## Smith Sails for Europe

H. J. Smith, of the Continental Machinery Company, New York City, sailed for Europe on the S. S. Aquitania on June 27. During his trip he will cover the entire continent in the interests of his company. Mr. Smith spent several months abroad last Fall and Winter having returned to this country in February. In an interview before sailing he stated that although his company was just in its infancy it has been successful with its line of specialized rubber machinery and has plenty of additional business in view during the balance of this year. Demand of his clients abroad necessitated this trip, Mr. Smith stated.

F. A. SEIBERLING, president, Seiberling Rubber Company, Akron, has been issued a basic patent on the Seiberling vapor cure process of tire vulcanizing by the U. S. Patent Office.

CHESTER T. "CHET" MORLEIGE, formerly vice-president in charge of sales for the India Tire Company, has joined the sales staff of B. F. Goodrich. He has been associated with the rubber industry since 1920 when he joined the American Rubber and Tire Company.

WALLACE H. CAROTHERS, du Pont research chemist noted for his synthetic rubber activities, was recently elected to membership in the National Academy of Sciences, Washington, the first industrial organic chemist to have achieved this distinction.

JAY E. MILLER, assistant sales manager, tire division, Miller Rubber Company, Akron, was married to MISS ELIZABETH STREINE, of New Bremen, Ohio, last month.

A. S. BISHOP, general sales manager, Goodyear Tyre and Rubber Company (Great Britain), Ltd., has been elected to the board of directors of that company.

HAROLD T. MARTIN has resigned as manager, factory personnel department, Fisk Rubber Company, to become field man with the Bureau of Unemployment Compensation, at Washington, D. C.

ERNEST A. DOERSCHUK, general credit manager, B. F. Goodrich Company, Akron, completed 20 years of service with that company last month and was presented with his service pin on June 27.

C. S. REEVE, manager, research development, The Barrett Company, Leonia, N. J., was elected to the Executive Committee of the A.S.T.M. recently. He will serve for two years.

## Awarding Dealer Plaques

An award, in the form of a wall plaque, 12 inches high, will be given to every tire dealer in the United States who has sold Goodrich tires for five years or more by the B. F. Goodrich Company, Akron. The length of continuous association with the Goodrich organization in five year periods will be indicated on the plaques.

## Deny Goodyear Rumors

Officials of Sears, Roebuck and Company, at Chicago, have denied rumors originating in Akron, that the company was planning to buy or lease Plant 1 of the Goodyear Tire and Rubber Company. A. S. Barrow, supervisor of the Sears' hardware, electrical and automotive accessory division, stated that, "There is no foundation for the rumor that we plan to lease the Akron plant of Goodyear." At Akron, Goodyear officials declined to "dignify a rumor" by any form of denial or affirmation. The rumors indicated that the move would be a logical one if Goodyear loses its appeal from the Federal Trade Commission's order to cease granting special price privileges to Sears-Roebuck.

## Organize New Wire Firm

The Rome Cable Corporation has been organized at 330 Ridge Street, Rome, N. Y., by H. T. Dyett and other former associates of the Rome Wire Company. The new company will manufacture insulated wires and cables, as well as copper rods, bars, etc. Mr. Dyett is president of the new company, while H. W. Bernard is vice-president and treasurer, C. A. Scott is vice-president and sales manager, and P. A. Williams is plant manager.

ROGER STANLEY FIRESTONE, youngest son of Harvey S. Firestone, Sr., and associated with the Firestone Tire and Rubber Company, will be married in the Fall. He was engaged to MISS MARY SEAGRAVE DAVIS, of Lawrenceville, N. J., on June 15.

# Obituaries

## *Julius A. Nieuwland*

Dr. Julius A. Nieuwland, Professor of Organic Chemistry at Notre Dame University and internationally recognized as the "Father of Synthetic Rubber," died in Washington, D. C., on June 11, from a heart attack. He was stricken while visiting Catholic Univer-

sity where he had intended to pursue special research studies during the Summer. He was 58 years old.

Father Nieuwland was born at Hansbeke, Belgium, in 1878, and was brought to this country by his parents several years later, the family settling in South Bend. He received his early education in the parochial schools of South Bend, was awarded his B.A. at Notre Dame in 1899, was ordained in 1903, and received his doctorate at Catholic University the following year. In 1905 he was appointed to the teaching staff of Notre Dame with which he was associated up until the time of his death, conducting all of his extensive experiments in the laboratories of the University.

Early in 1906 Dr. Nieuwland stumbled on the principles on which synthetic rubber is now based. Through the years he added to his store of knowledge but it was not until 1925, after several du Pont chemists heard him read a paper on the subject at Rochester, N. Y., that the du Pont Company made arrangements with him to carry on his experiments more fully, providing the necessary finances, which shortly led to the completion of the work and introduction of the first commercial synthetic rubber. He was awarded several honors for his work in this connection including a gold medal given to him by the American Institute in February, 1935, and the William H. Nichols Medal presented by the New York Section of the A.C.S. in the same year.

During the World War Dr. Nieuwland won international acclaim for his discovery of Lewisite gas, although it was not made practical until after the war. He claimed that use of the gas would be more humane than bullets because it would incapacitate thousands of men and force their removal from the line of fire. In May of this year he was awarded the Mendel Medal for 1936 at Villanova College for his work in this connection.

Although his important contributions to chemistry overshadowed his other achievements, Dr. Nieuwland ranked among the leaders of the nation in the field of systematic botany. It was as a botanist that he built one of the most complete libraries at Notre Dame on any scientific subject. In 1909 he founded the *American Midland Naturalist*, a journal devoted to natural history of the midland states. Up until 1918 his major energies were dedicated to this field, and at the time of his death he was botany librarian and curator of the Botany Herbarium and the E. L. Greene Herbarium at Notre Dame.

In addition to all of his scientific prowess, Father Nieuwland also distinguished himself as a priest and educator. Perhaps the greatest tribute ever paid to him was one by the Rev. Eugene Burke, C.S.C., of Notre Dame, who, in introducing him at the dinner in New York City at which he was presented with the William H. Nichols medal, one of the highest chemical honors, said: "He has not been absorbed by science. He has a universal interest. He is human. He is humble, always ready to learn something from any one. He possesses the real spirit of the scientist."

## *Alexander Spencer*

Alexander Spencer, president of the Research Association of British Rubber Manufacturers and for the past seventeen years chairman of George Spencer, Moulton and Company, Ltd., died at the age of 76 on June 13 at his home in England. He was one of the pioneers of rubber in railway construction. Born in 1859, Mr. Spencer was the second son of George Spencer, one of the founders of the firm of George Spencer, Moulton and Company. Stephen Moulton was the individual selected by Charles Goodyear to interest the British in his vulcanization process. The elder Spencer was engaged in designing railway buffing and draw-bar springs as far back as 1851, and was joined by Alexander Spencer in 1880, after the latter had served an apprenticeship in the railroad shops at Derby. Alexander Spencer devoted his life work to the promotion of rubber springs for railways. Up until the time of his death he was active in the affairs of the company at Westminster. He was also a member of the directorates of several large industrial companies, and an active member of the Institution of the Rubber Industry and the Institution of Mechanical Engineers, besides being president of the Research Association of British Rubber Manufacturers.

## *Harry Garman*

Harry Garman, for 34 years associated with the engineering division of the Goodyear Tire and Rubber Company, died at his home at 279 West Center Street, in Akron, on June 19, at the age of 70. Death was attributed to a fall from a ladder Mr. Garman had mounted to pick cherries from a tree in his own back yard, a piece of wood puncturing his diaphragm in the fall. He was a member of the Akron Commandery Knights Templar, Tadmor Temple Shrine and of the Adoniram Masonic lodge. He was chairman of the convention committee for the 23rd Grand Council of the Universal Craftsmen Council of Engineers at its meeting in Akron a few years ago. Funeral services were conducted at his home on June 22 with interment at Bowdil, Ohio. He leaves a wife and four daughters.

## *Merle C. Scrote*

Merle C. Scrote, a retired engineer of the B. F. Goodrich Company, Akron, died suddenly at his home, 1181 Kenmore Boulevard, on June 24, at the age of 56. He was a veteran of the Spanish-American war, the Philippine Island insurrections and the Boxer rebellion in China. Burial was in Mt. Peace Cemetery, Akron. He leaves a widow, two daughters and a son.

## Traces Carbon Progress

Oscar Nelson, president of the United Carbon Company, Charleston, West Virginia, in a special section of a recent issue of the *Journal of Commerce* devoted to the conference of the Manufacturing Chemists of America, traced the progress of carbon black since its commercial inception. He described the discovery in 1914 indicating that carbon black could be mixed with rubber giving a reinforcing effect not possible theretofore, and pointed out that today the rubber industry consumes the greatest volume of carbon black, with the ink industry second in line. Mr. Nelson also discussed the research activities of his company, stating that such activities formed an important part of the company's service to its customers. The development of dustless carbon black was indicated to be one of the results achieved by United Carbon's laboratory staff.

# Financial News

## GENERAL TIRE PLANS TO INCREASE SHARES

A special meeting of the holders of the common capital stock of the General Tire and Rubber Company will be held at the Akron offices of the company on July 16 for the purpose of approving a plan to change the par value of the shares of authorized common stock from $25 per share to $5 per share. Since there are 100,000 authorized shares in all, the plan, if approved, would increase the number of shares to 500,000.

According to the announcement of the special meeting authorized by the board of directors, revision of the financial structure as proposed might result in "a more stable market for the stock which would be to the advantage of all common stockholders." This is interpreted in financial circles to indicate that General is seeking additional capital for expansion purposes.

The company now has 13,000 shares of authorized common stock in its treasury which, if the stock was split 5 for 1, would total 65,000 shares which, at a $5 par value, could be more easily marketed. It is a known fact that General has been seeking an additional factory, preferably out of Akron, with the South being mentioned as the probable site.

The letter to stockholders inviting their proxies pointed out that if the financial revision receives a two-thirds vote of approval five shares of the $5-par stock would be issued to each holder in exchange for each $25-par share. The letter also stressed the fact that "when and as the changes are made, the authorized capital stock of the company will not be increased or diminished—the aggregate par value of the common shares remaining the same."

## U. S. RUBBER RETIRING BALANCE OF 6.5% NOTES

As expected, the United States Rubber Company has announced that on September 1, 1936, the next interest date, it will retire the balance of its outstanding 6½% serial gold notes. There are only two series remaining, i.e., Series N, due March 1, 1939, and Series O, due March 1, 1940, redeemable at 102½ and 103½ respectively, together with accrued interest to September 1, 1936. The two series aggregate $4,000,000 in principal amount. Payment on both series will be made at the main offices of the Guaranty Trust Company, in New York City, on the affixed date.

Shortly after the present management took charge of the company in January, 1929, U. S. Rubber launched its program of retiring its 6½% serial gold notes, $46,000,000 of funded debt having already been retired without recourse to borrowing. Retirement of the remaining two serials will make the total reduction in funded debt more than $50,000,000 since 1929 and will result in annual savings of more than $3,000,000 in interest charges. The original amount of the 6½% serial notes, issued in 1925, was $30,000,000.

## FIRESTONE INCREASES ITS SIX-MONTH PROFIT

Operations of the Firestone Tire and Rubber Company and subsidiaries, including the Firestone Service Stores, for the six month period ended on April 30, 1936, resulted in a net profit of $2,754,675 after taxes, depreciation, depletion, interest and other charges, equal to 70 cents each on 1,933,317 shares of $10-par common stock after the payment of dividend requirements on the 6% preferred stock. In the same period a year ago earnings amounted to $2,155,084, or 40 cents on the outstanding common stock. Current earnings are 75% above those of the same period last year.

In view of the fact that Firestone earned $5,649,000, or $1.53 per share of common stock in its last fiscal year, indicating that earnings for the second six months of that period were approximately four times those of the first half, net earnings for the current fiscal year ending on October 31 may exceed $7,000,000 if a similar increase is recorded in the second half of the current period, which would approximate $2.75 per common share. Since the present report did not reflect the benefits of the 10% tire price rise made effective on May 1, and since an additional price rise is expected shortly, there is a strong possibility that Firestone earnings for the fiscal year ending on October 31 will meet with expectations.

Firestone common dividends were raised from 40 cents to $1.20 early this year, but if earnings continue on the present basis the regular rate may be increased still more or a substantial extra dividend declared.

### Declare Dayton Dividend

A dividend of $1.00 on account of accumulations on the Class A stock, was declared recently by directors of the Dayton Rubber Manufacturing Company, Dayton, Ohio. Payment of this dividend reduces accumulations to $2.00 per share, it was announced.

### Loss for National Machinery

For the quarter ended March 31, 1936, the National Rubber Machinery Company, Akron, reports a net loss of $19,566, after taxes, depreciation, provision for bad debt, and other deductions.

## MAY CONSUMPTION IS 2.7% BELOW APRIL

Consumption of crude rubber by manufacturers in the United States for the month of May is estimated to be 50,482 long tons, which compares with 51,897 long tons for April. May consumption shows a decrease of approximately 2.7% under April, although 22.8% above May a year ago, according to statistics released by the Rubber Manufacturers Association. Consumption for May, 1935, was 41,101 (revised) long tons.

Imports of crude rubber for May are reported to be 35,600 long tons, a decrease of 11.8% under the April figure of 40,365 long tons, although 32.5% above the 26,866 long tons imported in May, 1935.

Total domestic stocks of crude rubber on hand May 31 are estimated at 248,317 long tons, which compares with April 30 stocks of 264,228 long tons and 322,559 (revised) long tons on hand May 31, 1935.

Crude rubber afloat to U. S. ports as of May 31 is estimated to be 48,860 long tons as compared with 47,678 long tons afloat on April 30 and 44,375 long tons afloat on May 31 a year ago.

May reclaimed rubber consumption is estimated at 10,396 long tons; production, 11,512 long tons; and stocks on hand May 31, 22,852 long tons.

## APRIL TIRE SHIPMENTS 27.1% ABOVE MARCH

Shipments of pneumatic casings during the month of April are estimated to be 4,902,721 units, an increase of 27.1% above March although 4.7% below shipments made in April, 1935, according to statistics released by the Rubber Manufacturers Association.

Production of pneumatic casings for April is estimated to be 4,854,133 casings, an increase of 33.4% over March and 7.6% above April, 1935.

Pneumatic casings in the hands of manufacturers on April 30, 1936, are estimated to be 9,034,017 units, a decrease of less than 1% under the stocks on hand March 31, and 17.9% below stocks on hand April 30, 1935.

The actual figures are as follows:

PNEUMATIC CASINGS

| | *Shipments* | *Production* | *Inventory* |
|---|---|---|---|
| Apr., 1936 | 4,902,721 | 4,854,133 | 9,034,017 |
| Mar., 1936 | 3,855,970 | 3,637,969 | 9,087,020 |
| Apr., 1935 | 5,143,599 | 4,511,735 | 11,003,237 |
| Apr., 1934 | 4,438,379 | 4,769,981 | 11,980,731 |

### Eastern Color Moves

The Eastern Color and Chemical Company, which specializes in the purchase of job-lots and discontinued merchandise of all kinds, more particularly those items pertaining to such raw materials as chemicals, oils, waxes, solvents, etc., has moved its headquarters to 235 Fourth Avenue, in New York City. The company was formerly located on Nassau Street in that city.

### New Tire War Threatens

Despite the apparent harmony on tire prices among leading rubber manufacturers, a new tire war is believed in the offing as a result of the insurance policy scheme adopted by Sears, Roebuck and Company. Two months ago the mail order house announced that it would grant an insurance policy to each purchaser of its better grade tires against loss of life or damages sustained because of punctures or blowouts. At present this offer is being restricted to the State of Illinois. If it proves successful, however, Sears-Roebuck will make it available in a number of other states which may lead to a new tire price war.

### Swan Adding Addition

A 50-foot brick addition to its factory in Bucyrus, Ohio, is being constructed by the Swan Rubber Company, according to Mort Nussbaum, president. The new addition will house the hydraulic press department, with several new presses already ordered. Starting six years ago with approximately 15 workers, Swan now employs 150 people, the main plant being run in three daily shifts. The company manufactures tires for bicycles, baby carriages and lawn mowers in addition to brake lining, rubber pedals, handle grips and other small rubber articles.

### Paragon Rubber Moves

The factories of the American Character Doll Company, Inc., and its affiliate, the Paragon Rubber Corporation, have been removed from Brooklyn, N. Y., to Easthampton, Mass. The new plant has over 60,000 square feet of floor space equipped with modern machinery for the production of composition and rubber dolls. A showroom is being maintained at 200 Fifth Avenue, in New York.

### Simplex Elects Officers

At a recent meeting of its directorate, the Simplex Wire and Cable Company, Cambridge, Mass., elected Everett Morss, Jr., president and treasurer; Charles R. Boggs, vice-president and general manager; Philip R. Morss, vice-president, clerk and secretary; and J. Arthur Gibson, vice-president and assistant treasurer. William S. Davis continues as sales manager, with George L. Roberts assistant sales manager.

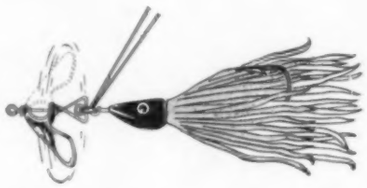
### Institute Bulletin Service

The Woburn Degreasing Company of New Jersey, located at Harrison, N. J., manufacturers of chemicals from oils and fats, has instituted a new bulletin service. To be issued from time to time, the bulletins will contain technical information concerning the application of Woburn products in the rubber and other industries.

# New Rubber Goods

### Arbogast Rubber "Petticoat"

Fred Arbogast, 100 North Street, Akron, has introduced a rubber "petticoat," or skirt, for the Hawaiian Wriggler, a special type of fishing lure. The



skirt, consisting of long rubber threads, has a small hole at the end which goes on the bend of the hook on any spoon or spinner where visibility and action are needed. The skirts are available in red, white and yellow colors, and completely hide the hook when in use.

### Cambridge Air-O-Flow Shoes

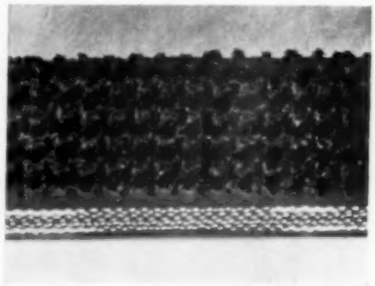
Under the trade term of Air-O-Flow, the Cambridge Rubber Company, Cambridge, Mass., has introduced what it terms its "greatest line of sport wear in a quarter century of manufacturing experience." All of the shoes in this new line incorporate rubber in their construction, with rubber soles used on almost every model, two of which are illustrated herewith, i.e., the Cubo Sports Oxford and the Army Duck Cubo. The Air-O-Flow principle embraces a process of manufacturing insoles in such manner that air continually flows in and out while the shoes are being worn.

### Kleenti Tea Strainer

The Kleenti Tea Strainer merchandised by Artleigh Products, Inc., 159 East 60th Street, New York City, is a new item designed for household use. Made of Bakelite, Kleenti strains the tea as it is poured into cups and does not drip. A rubber ring is fitted on the end of the strainer.

### Griptop Conveyor Belt

A new package conveyor belt, known as Griptop, has been introduced by the B. F. Goodrich Company, Akron, Ohio.



The belt features a special rough surface on the rubber cover for handling packages, cartons and boxes up inclined conveyors. The cover surface consists of a series of small rubber "fingers" of which there are 3,000 in every square foot of belt, the "fingers" giving the belt unusual gripping power. Unlike other types, the Griptop surface has a tendency to increase in coefficient of friction with the increase of applied weight.

**Left: The Cambridge Army Duck Cubo equipped with the new Air-O-Flow insole, especially designed for rugged sports use.**

**Right: The Cambridge Cubo Sports Oxford, also equipped with the Air-O-Flow feature, the latest development in cool shoes.**

# MARKETS

## RUBBER—COTTON AND FABRICS—CHEMICALS

**NEW YORK, JULY 9, 1936**

## Crude Rubber

FROM a 15.68 quotation for spot rubber on the Exchange on June 13, prices climbed steadily throughout the balance of the month and the first week in July to reach a 16.56 quotation yesterday (July 8). This steady price advance was due almost solely to the supply and demand factors, being heavily influenced by the continued reduction in world stocks which overcame trade hesitancy caused by foreign currency situations. For the first six months of this year, United States stocks have been reduced by 70,000 tons, while in the similar period London reports a 41,000 ton reduction. Record consumption figures have been set in America for the first six month period but this is not expected to continue throughout the balance of the month. The price advance in the last few days has also been abetted by the decision of the International Rubber Regulation Committee to leave the quotas unchanged until its next meeting in September. Spot prices are expected to remain above a 16 cent level for some time to come. Quotations in the outside market, Exchange, London and Singapore, follow:

As of July 8

***Plantations—***

| | | | |
|---|---|---|---|
| Ribbed Smoked Sheets— | | | |
| No. 1 Spot | — | @ | .16 5/16 |
| July-September | — | @ | .16 1/16 |
| October-December | — | @ | .16 1/8 |
| No. 2 | — | @ | .16 1/2 |
| No. 3 | — | @ | .16 7/16 |
| No. 4 | — | @ | .16 3/8 |
| Thin Latex Crepe | — | @ | .16 7/8 |
| Thick Latex Crepe | — | @ | .16 7/8 |
| Brown Crepe, No. 1 | — | @ | .16 1/2 |
| Brown Crepe, No. 2 | — | @ | .16 7/16 |
| Amber Crepe, No. 2 | — | @ | .16 1/2 |
| Amber Crepe, No. 3 | — | @ | .16 7/16 |
| Amber Crepe, No. 4 | — | @ | .16 1/8 |
| Brown Crepe, Rolled | — | @ | .16 1/8 |

***Latex—***

| | | | |
|---|---|---|---|
| Liquid Latex, per gal. | .60 | @ | — |

***Paras—***

| | | | |
|---|---|---|---|
| Up-River, fine | — | @ | .17 3/4 |
| Acre Bolivian, fine | — | @ | .17 3/8 |

***Balata—***

| | | | |
|---|---|---|---|
| Block, Ciudad | — | @ | .32 |

### LONDON MARKET

Standard Smoked Sheets—Buyers—July 8

| | | | |
|---|---|---|---|
| July | — | @ | 7 3/4d |
| October-December | — | @ | 7 13/16d |

### SINGAPORE MARKET

Standard Smoked Sheets—Sellers—July 8

| | | | |
|---|---|---|---|
| July | — | @ | 7 5/8d |
| October-December | — | @ | 7 21/32d |

## Reclaimed Rubber

Continued activity in the automotive and building industries is offsetting the usual Summer lull with the result that reclaimers are fairly active. This situation has applied for the last several months and produced a consistently steady market. There have been no changes in prices since our previous report. Quotations follow:

***High Tensile***

| | | | |
|---|---|---|---|
| Super-reclaim, black lb. | .08 3/4 | @ | .09 |
| High Tensile Red lb. | .07 3/4 | @ | .08 |

***Shoe***

| | | | |
|---|---|---|---|
| Unwashed lb. | .06 1/2 | @ | .06 3/4 |
| Washed lb. | .08 | @ | .09 |

***Tube***

| | | | |
|---|---|---|---|
| No. 1 (Floating) lb. | .14 | @ | .14 1/4 |
| No. 2 (Compounded) lb. | .07 1/4 | @ | .07 1/2 |
| Red tube lb. | .07 1/4 | @ | .07 3/4 |

***Tires***

| | | | |
|---|---|---|---|
| Black lb. | .05 | @ | .05 1/4 |
| Black, selected tires lb. | .05 1/4 | @ | .05 1/2 |
| Dark Gray lb. | .06 1/2 | @ | .06 3/4 |
| White lb. | .10 | @ | .10 1/4 |
| Truck, Heavy Gravity lb. | .05 1/2 | @ | .06 |
| Truck, Light Gravity lb. | .06 | @ | .06 1/4 |

***Miscellaneous***

| | | | |
|---|---|---|---|
| Mechanical blends lb. | .03 1/2 | @ | .04 1/2 |

## Scrap Rubber

*(Delivered Akron Mills)*

Activity among the reclaimers is keeping scrap rubber dealers equally active, there being a constant demand for scrap of all types. The continued rise in crude rubber prices is also favoring this branch of the industry, with the usual Summer lull being avoided. Current quotations follow:

(Prices to Consumers)

| | | | |
|---|---|---|---|
| Auto tire peelings ton | 17.50 | @ | 19.00 |
| Mixed auto ton | 8.50 | @ | 10.00 |
| Beadless tires ton | 13.50 | @ | 15.00 |
| Clean solid truck tires ton | 26.50 | @ | 28.00 |
| Boots and shoes ton | 15.00 | @ | 17.50 |
| Arctics, untrimmed ton | 10.00 | @ | 12.50 |
| Inner tubes, No. 1 lb. | .09 | @ | .10 |
| Inner tubes, No. 2 lb. | .04 1/4 | @ | .04 3/8 |
| Inner tubes, Red lb. | .04 1/4 | @ | .04 3/8 |

## Cotton

After holding steady around a price of 11.78 in the early part of June, spot cotton prices started to rise about the middle of the month and continued a surprising advance during the latter part of the month and early July to surpass the highest levels reached during the Summer of 1935. The advance in mid-June was attributed to a combination of favorable forces, foremost among these being a scarcity of spot actuals, closely followed by the reported heavy bookings for textile cloths.

Prices eased slightly during the last week in June on the announcement that the Commodity Credit Corporation would release an indefinite amount of spot cotton at fixed minimum prices, but soared to a price of 13.23, the highest level since September, 1934, yesterday (July 8) as trade and speculative interests bought heavily under the combined effect of a Government acreage estimate of 30,621,000 for this season and confirmation that for the first time in six years the Government is completely out of the futures market. Quotations for middling uplands on the N. Y. Cotton Exchange follow:

| | June 8 | July 8 | | |
|---|---|---|---|---|
| | Close | High | Low | Close |
| July | 11.63 | 13.18 | 12.63 | 13.13 |
| October | 10.88 | 12.50 | 11.89 | 12.48 |
| December | 10.84 | 12.47 | 11.88 | 12.45 |

## Tire Fabrics

(Prices Net at the Mill)

| | | | |
|---|---|---|---|
| Peeler, carded, 23/5/3 lb. | .30 | @ | .30 3/4 |
| Peeler, carded, 23/4/3 lb. | .31 | @ | .31 1/2 |
| Peeler, carded, 15/3/3 lb. | .28 | @ | .28 1/2 |
| Peeler, carded, 13/3/3 lb. | .27 | @ | .27 1/2 |
| Egyptian, carded, 23/5/3 lb. | .44 1/4 | @ | .44 3/4 |
| Egyptian, combed, 23/5/3 lb. | .49 1/4 | @ | .49 3/4 |
| CHAFERS | | | |
| Carded, American, 1 1/16" lb. | .31 | @ | .33 1/2 |
| Carded, American, 1" lb. | .28 1/2 | @ | .31 |

## Sheetings

| | | | | | |
|---|---|---|---|---|---|
| 48x40 | 36 in. | 5.50 lb. | — | @ | .05 1/8 |
| 40x40 | 36 in. | 6.15 lb. | — | @ | .04 5/8 |
| 40x36 | 36 in. | 6.50 lb. | — | @ | .04 1/8 |
| 48x48 | 40 in. | 2.50 lb. | — | @ | .09 |
| 48x48 | 40 in. | 2.85 lb. | — | @ | .08 |
| 56x60 | 40 in. | 3.60 lb. | — | @ | .07 7/8 |
| 48x44 | 40 in. | 3.75 lb. | — | @ | .07 1/8 |
| 44x40 | 40 in. | 4.25 lb. | — | @ | .06 1/4 |

## Ducks

| | | | |
|---|---|---|---|
| Enameling lb. | .28 | @ | .32 |
| Belting and Hose lb. | .26 1/4 | @ | .26 1/2 |
| Single filling, A grade lb. | .14 3/4 | @ | — |
| Double filling lb. | .14 3/4 | @ | — |

## *Closing Rubber Prices on New York Commodity Exchange, Inc.*

*No. 1 Standard Contract of 10 tons*

FROM JUNE 9 TO JULY 8

| Date | Spot | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | Sales |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| June 9 | 15.81 | 15.73 | 15.77 | 15.81 | 15.86 | 15.89 | 15.93 | 15.97 | 16.00 | 16.03 | 16.07 | 16.10 | 16.14 | .... | 83 |
| 10 | 15.75 | 15.69 | 15.73 | 15.78 | 15.83 | 15.86 | 15.89 | 15.93 | 15.96 | 16.00 | 16.04 | 16.08 | 16.12 | .... | 65 |
| 11 | 15.81 | 15.73 | 15.77 | 15.81 | 15.86 | 15.89 | 15.93 | 15.97 | 16.00 | 16.04 | 16.08 | 16.12 | 16.16 | .... | 207 |
| 12 | 15.85 | 15.75 | 15.79 | 15.83 | 15.88 | 15.91 | 15.95 | 15.99 | 16.02 | 16.05 | 16.08 | 16.13 | 16.19 | .... | 125 |
| 13 | 15.68 | 15.59 | 15.63 | 15.67 | 15.72 | 15.75 | 15.77 | 15.80 | 15.86 | 15.88 | 15.91 | 15.95 | 15.99 | .... | 66 |
| 14 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ... |
| 15 | 15.75 | 15.67 | 15.71 | 15.76 | 15.82 | 15.86 | 15.89 | 15.92 | 15.96 | 15.99 | 16.02 | 16.06 | 16.11 | .... | 103 |
| 16 | 15.81 | 15.75 | 15.79 | 15.84 | 15.89 | 15.92 | 15.95 | 15.98 | 16.02 | 16.05 | 16.09 | 16.13 | 16.17 | .... | 99 |
| 17 | 15.75 | 15.65 | 15.69 | 15.75 | 15.81 | 15.84 | 15.87 | 15.90 | 15.93 | 15.97 | 16.01 | 16.06 | 16.11 | .... | 81 |
| 18 | 15.81 | 15.71 | 15.75 | 15.80 | 15.85 | 15.88 | 15.92 | 15.96 | 15.99 | 16.02 | 16.05 | 16.10 | 16.15 | .... | 118 |
| 19 | 15.81 | 15.73 | 15.77 | 15.82 | 15.87 | 15.90 | 15.94 | 15.98 | 16.01 | 16.04 | 16.07 | 16.12 | 16.17 | .... | 109 |
| 20 | 15.88 | 15.84 | 15.88 | 15.93 | 15.98 | 16.01 | 16.05 | 16.09 | 16.11 | 16.14 | 16.17 | 16.21 | 16.26 | .... | 163 |
| 21 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ... |
| 22 | 15.93 | 15.86 | 15.90 | 15.96 | 16.03 | 16.06 | 16.09 | 16.13 | 16.17 | 16.21 | 16.25 | 16.29 | 16.33 | .... | 188 |
| 23 | 16.06 | 15.97 | 16.01 | 16.07 | 16.13 | 16.16 | 16.20 | 16.24 | 16.28 | 16.32 | 16.36 | 16.41 | 16.46 | .... | 235 |
| 24 | 16.06 | 15.97 | 16.00 | 16.06 | 16.12 | 16.15 | 16.19 | 16.23 | 16.25 | 16.28 | 16.32 | 16.37 | 16.43 | .... | 211 |
| 25 | 16.06 | 16.00 | 16.03 | 16.08 | 16.14 | 16.18 | 16.22 | 16.26 | 16.30 | 16.34 | 16.38 | 16.43 | 16.49 | .... | 160 |
| 26 | 16.00 | .... | 15.96 | 16.03 | 16.10 | 16.13 | 16.17 | 16.22 | 16.25 | 16.28 | 16.32 | 16.37 | 16.43 | .... | 220 |
| 27 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ... |
| 28 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ... |
| 29 | 16.06 | .... | 16.01 | 16.05 | 16.10 | 16.14 | 16.18 | 16.23 | 16.26 | 16.30 | 16.34 | 16.39 | 16.45 | .... | 120 |
| 30 | 16.18 | .... | 16.14 | 16.18 | 16.23 | 16.27 | 16.31 | 16.36 | 16.40 | 16.44 | 16.48 | 16.53 | 16.58 | .... | 234 |
| July 1 | 16.18 | .... | 16.15 | 16.20 | 16.25 | 16.30 | 16.35 | 16.40 | 16.43 | 16.46 | 16.50 | 16.55 | 16.60 | 16.65 | 42 |
| 2 | 16.25 | .... | 16.25 | 16.30 | 16.35 | 16.39 | 16.43 | 16.47 | 16.51 | 16.55 | 16.59 | 16.62 | 16.65 | 16.69 | 132 |
| 3 | 16.37 | .... | 16.33 | 16.40 | 16.48 | 16.50 | 16.53 | 16.57 | 16.60 | 16.64 | 16.68 | 16.72 | 16.77 | 16.81 | 347 |
| 4 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ... |
| 5 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | ... |
| 6 | 16.50 | .... | 16.50 | 16.55 | 16.60 | 16.62 | 16.65 | 16.68 | 16.73 | 16.76 | 16.79 | 16.83 | 16.87 | 16.91 | 378 |
| 7 | 16.50 | .... | 16.44 | 16.48 | 16.52 | 16.56 | 16.60 | 16.65 | 16.67 | 16.69 | 16.72 | 16.77 | 16.83 | 16.89 | 216 |
| 8 | 16.56 | .... | 16.50 | 16.55 | 16.60 | 16.63 | 16.66 | 16.70 | 16.75 | 16.77 | 16.79 | 16.83 | 16.87 | 16.91 | 115 |

# Rubber CHEMICAL Markets

NEW YORK, JULY 10, 1936

[All Quotations F.O.B. Works Unless Otherwise Noted]

## ACCELERATORS

| | | | |
|---|---|---|---|
| **Organic** | | | |
| A-1 (Thiocarbanilid) | lb. | .21 @ | .25 |
| A-5-10 | lb. | .33 @ | .36 |
| A-7 | lb. | .53 @ | .65 |
| A-11 | lb. | .60 @ | .75 |
| A-16 | lb. | .55 @ | .65 |
| A-19 | lb. | .56 @ | .75 |
| A-32 | lb. | .70 @ | .80 |
| A-77 | lb. | — @ | — |
| Aldehyde ammonia, crystals | lb. | .65 @ | .70 |
| Altax | lb. | — @ | — |
| Captax | lb. | | |
| Crylene | lb. | .55 @ | .65 |
| paste | lb. | .45 @ | .55 |
| Di-Ortho-Tolyguanidine | lb. | .44 @ | .47 |
| Diphenylguanidine | lb. | .35 @ | .37 |
| Ethylidene aniline | lb. | .45 @ | .47½ |
| Formaldehyde aniline | lb. | .37½ @ | .42 |
| Guantal | lb. | .42 @ | .51 |
| Heptene | lb. | .40 @ | — |
| Hexamethylene-tetramine | lb. | .37 @ | — |
| Lead Oleate, No. 999 | lb. | .11 @ | — |
| Witco | lb. | .11 @ | — |
| Lithex | lb. | .18 @ | .20 |
| Methylenedianiline | lb. | .36 @ | .37 |
| Monex | lb. | 3.25 @ | — |
| Oxynone | lb. | .68 @ | .80 |
| Phenex | lb. | .50 @ | .55 |
| Pipsolene | lb. | 3.55 @ | 4.00 |
| R & H 40 | lb. | .40 @ | .41 |
| R & H 50 | lb. | .40 @ | .41 |
| R-2 | lb. | 1.55 @ | 1.90 |
| Safex | lb. | 1.20 @ | 1.25 |
| SPDX | lb. | .75 @ | — |
| Super-Sulphur No. 1 | lb. | | |
| No. 2 | lb. | | |
| Thiocarbanilid, drums | lb. | .21 @ | .25 |
| Trimene | lb. | .75 @ | — |
| base | lb. | 1.20 @ | — |
| Triphenylguanidine | lb. | .58 @ | .60 |
| Tuads | lb. | | |
| Ureka | lb. | .62 @ | 1.00 |
| Ureka B | lb. | — @ | — |
| Ureka C | lb. | .58 @ | .69 |
| Vulcanex | lb. | | |
| Vulcone | lb. | | |
| Vulcanol | lb. | | |
| Z-88-P | lb. | .48 @ | .60 |
| Zimate | lb. | | |
| **Inorganic** | | | |
| Litharge, domestic | lb. | .06½ @ | .07 |
| Magnesia, calcined, heavy | lb. | .04 @ | — |

## COLORS

**Blacks (See Compounding Materials)**

| | | | |
|---|---|---|---|
| **Blues** | | | |
| Prussian | lb. | .37 @ | .39 |
| Ultramarine | lb. | .15 @ | — |
| **Browns** | | | |
| Sienna, Italian | lb. | .06 @ | '13 |
| Umber, Turkey | lb | .04 @ | .04½ |
| **Greens** | | | |
| Chrome, light | lb. | .20 @ | .30 |
| medium | lb. | .21 @ | .31 |
| Chromium Oxide, bbl. | lb. | .19 @ | .20 |
| Guignet's Green | lb. | .70 @ | — |
| **Reds** | | | |
| Antimony | | | |
| crimson, 15/17 | lb. | .48 @ | — |
| sulfur, free | lb. | .48 @ | .60 |
| Indian English | lb. | .09 @ | .10 |
| Domestic (Maroon) | lb. | .11 @ | — |
| Red oxide, pure | lb. | .10 @ | .12 |
| Rub-Er-Red, f.o.b. Easton | lb. | .09¼ @ | — |
| **Whites** | | | |
| Cryptone CB, No. 21 | lb. | .06 @ | .06¼ |
| Cryptone, No. 19 | lb. | .06 @ | .06¼ |
| Cryptone, ZS-20 | lb. | .10½ @ | .10¾ |
| Cryptone, ZS-86 | lb. | .10½ @ | .10¾ |
| Lithopone | | | |
| Albalith, black label—11 | lb. | .04½ @ | .04¾ |
| Azolith | lb. | .04½ @ | .04¾ |
| Rayox | lb. | | |
| Titanium oxide | lb. | .17 @ | .18½ |
| Titanox B | lb. | .06 @ | .06¼ |
| Titanox C | lb. | .06 @ | .06¼ |
| **Zinc Oxide—American Process** | | | |
| American Azo: | | | |
| ZZZ (lead free) | lb. | .05 @ | .05¼ |
| ZZ (leaded) | lb. | .04⅞ @ | .05⅛ |
| Anaconda, lead free | lb. | .05 @ | .05¼ |
| Horsehead Lead Free Brand: | | | |
| Special—3 | lb. | .05 @ | .05¼ |
| XX Red—4 | lb. | .05 @ | .05¼ |
| XX Red—72 | lb. | .05 @ | .05¼ |
| XX Red—78 | | .05 @ | .05¼ |
| XX Red—103 | lb. | .05 @ | .05¼ |
| U. S. P.—X, bbls. | lb. | .08 @ | .08¼ |
| Kadox, black label—15 | lb. | .05 @ | .05¼ |
| Blue label—16 | lb. | .05 @ | .05¼ |
| Red label—17 | lb. | .05 @ | .05¼ |
| St. Joe, black label | lb. | .05 @ | .05¼ |
| green label | lb. | .05 @ | .05¼ |
| red label | lb. | .05 @ | .05¼ |
| **Zinc Oxide—French Process** | | | |
| Florence White seal—7 bbls. | lb. | — @ | .06¾ |
| Green seal—8 | lb. | .06 @ | .06¼ |
| Red seal—9 | lb. | .05½ @ | .05¾ |
| Yellows | | | |
| Chrome | lb. | .11 @ | .12 |
| Ocher, dom. med. | lb. | .02¾ @ | — |

## BLACKS

| | | | |
|---|---|---|---|
| Arrow "Aerfloted" Specification | lb. | .0535 @ | .0825 |
| Bone, powdered | lb. | .05½ @ | .12½ |
| Carbon, compressed | lb. | .0535 @ | .0825 |
| uncompressed | lb. | .0535 @ | .0825 |
| "Certified," Cabot | lb. | .0535 @ | .0825 |
| Spherons | lb. | .0535 @ | .0825 |
| "Disperso" | lb. | .0535 @ | .0825 |
| Drop, bbls. | lb. | .05½ @ | .14 |
| "Excello," compressed | lb. | .0535 @ | .0825 |
| "Fumonex" | lb. | .03 @ | .07 |
| "Gastex" | lb. | .03 @ | .07 |
| Lampblack | lb. | .07 @ | .12 |
| "Micronex" | lb. | .0535 @ | .0825 |
| "Supreme" | lb. | .0535 @ | .0825 |
| Thermatomic—"P 33" | lb. | — @ | — |
| "Thermax" | lb. | — @ | — |
| United "Dixie" & "Kosmos" | lb. | .0535 @ | .0825 |

## COMPOUNDING MATERIALS

| | | | |
|---|---|---|---|
| Aluminum Flake | ton. | 21.85 @ | 24.50 |
| Ammonia carbonate, lump | lb. | .10½ @ | .12 |
| Asbestine | ton | 13.00 @ | 15.00 |
| Barium carbonate (98-100%) | ton | 56.50 @ | 61.50 |
| Barium Dust | lb. | .05 @ | .06 |
| Barytes | ton | 23.65 @ | 31.15 |
| Basofor | lb. | .04½ @ | — |
| Bentonite | lb. | .02 @ | .03 |
| Blanc fixe dry f.o.b. works | ton | 70.00 @ | 75.00 |
| Calcene | ton | 37.50 @ | 45.00 |
| Catalpo (fact.) | lb. | .02 @ | — |
| Chalk, precipitated | | | |
| Suprex white, extra lt. | ton | 45.40 @ | 60.00 |
| heavy | ton | 45.00 @ | 55.00 |
| Clay, Kaolin, domestic | ton | 7.50 @ | 15.00 |
| Aerfloted, Suprex | ton | 8.50 @ | 10.00 |
| Congaree | ton | 9.00 @ | — |
| Dixie | ton | | |
| Dixie, Jr. | ton | | |
| McNamee | ton | | |
| Par | ton | | |
| Tensulite | | 15.00 @ | — |
| Witco | ton | 8.50 @ | 9.00 |
| Cotton Flock | lb. | .11 @ | .15 |
| Glues, extra white | lb. | .28 @ | .30 |
| medium white | lb. | .14 @ | .19 |
| Kalite No. 1 | ton | 30.00 @ | 55.00 |
| Kalite No. 3 | ton | 40.00 @ | 65.00 |
| Magnesium carbonate | lb. | .08 @ | — |
| Mica | ton | 35.00 @ | — |
| Pyrax A | ton | — @ | — |
| Rottenstone (powdered) | lb. | .02½ @ | .05 |
| Soapstone, powdered | ton | 16.00 @ | 22.00 |
| Starch, powdered | cwt. | 3.19 @ | 3.39 |
| Talc, domestic | ton | 16.00 @ | 18.00 |
| Whiting, commercial | ton | 17.00 @ | 18.00 |
| Columbia Filler | ton | 9.00 @ | 14.00 |
| English Cliffstone | ton | 33.00 @ | 43.00 |
| Sussex | ton | | |
| Witco | ton | 7.00 @ | — |
| Wood Flour | ton | 18.00 @ | 30.00 |
| Zinc Carbonate | lb. | .10½ @ | .11 |
| Zinc Stearate | lb. | .26 @ | — |

## MINERAL RUBBER

| | | | |
|---|---|---|---|
| Black Diamond | ton | 27.00 @ | — |
| Genasco, solid (factory) | ton | 25.00 @ | 27.00 |
| Hard Hydrocarbon | ton | | |
| Parmr. solid | ton | 31.00 @ | — |
| Pioneer, MR, solid | ton | | |
| Pioneer-granulated | ton | | |

## SPECIALTIES

| | | | |
|---|---|---|---|
| Aromatics—Rodo | lb. | | |
| Para-Dora No. 5145 | lb. | 2.00 @ | — |
| Sunproof | lb. | .35 @ | .37½ |
| Sponge Paste | lb. | — @ | .80 |
| Tonox | lb. | .56 @ | .60 |

## SOFTENERS

| | | | |
|---|---|---|---|
| **Acids** | | | |
| Acetic, 28%, bbls. | 100 lb. | 2.45 @ | 2.70 |
| glacial, USP, bbls. | 100 lb. | 14.00 @ | — |
| Nitric, 36 degrees | cwt. | 5.00 @ | 6.00 |
| Sulfuric, 66 degrees | ton | 15.50 @ | 16.50 |
| **Acids, Fatty** | | | |
| Laurex | lb. | .15 @ | .16 |
| Stearex | lb. | .08½ @ | .11¾ |
| Stearic, double pressed | lb. | .10 @ | .11 |
| Stearite | lb. | .08 @ | — |
| **Alkalies** | | | |
| Caustic Soda, 76% | cwt. | 3.60 @ | 3.75 |
| Soda Ash, 58% C.L. | cwt. | 2.52 @ | — |

| | | | |
|---|---|---|---|
| **Oils** | | | |
| Corn, refined, bbls. | lb. | .11½ @ | .11¾ |
| Cottonseed, crude | gal. | .093 @ | .10 |
| Cycline Oil | gal. | .15 @ | .28 |
| Degras, bbls. | lb. | .05¼ @ | .06¾ |
| Fluxrite | lb. | .05½ @ | .06½ |
| Palm Lagos | lb. | .05 @ | — |
| Niger | lb. | .04¾ @ | — |
| Para-Flux | gal. | .17 @ | — |
| Petrolatum, light | lb. | .03⅛ @ | .03¾ |
| Pigmentaroil, tank cars | gal. | .16 @ | — |
| in drums | gal. | .22 @ | .23½ |
| Pine, steam distilled | gal. | .64 @ | .65 |
| dest. dist., drums | gal. | .44 @ | .46 |
| Rosin Oil, cmpd | gal. | .40 @ | — |
| Rubtack | lb. | .40 @ | — |
| Seedine, c.l. | lb. | .07¼ @ | — |
| Tackol | lb. | .08½ @ | .18 |
| Witco Palm Oil | lb. | .05½ @ | — |
| Witco Softener | gal. | .15 @ | — |
| Woburn No. 8, c.l. | lb. | .06 @ | — |
| Wobonite, c.l. | lb. | .05 @ | — |
| **Resins and Pitches** | | | |
| Pitch, Burgundy | lb. | .03½ @ | — |
| coal tar | gal. | .07½ @ | .08 |
| hardwood | ton | 15.00 @ | — |
| pine, 200 lb. gr. wt. | bbl. | 4.00 @ | 4.50 |
| Rosin, grade K, 280 lb. | bbl. | 5.90 @ | — |
| Pigmentar, tank cars | gal. | .19 @ | — |
| in drums | gal. | .25 @ | .27 |
| R. S. L. Resin | lb. | — @ | — |
| Retort Pine Tar, drums | bbl. | 12.00 @ | 13.00 |
| **Solvents** | | | |
| Acetone, pure | lb. | .11 @ | — |
| Alcohol, denatured, methanol, No. 1 bbls. | gal. | .28 @ | .39 |
| Benzene, 90% | gal. | .18 @ | .23 |
| Beta-Trichlorethane | gal. | — @ | — |
| Bondogen | lb. | — @ | — |
| Carbon, bisulfide | lb. | .05¼ @ | .08 |
| Carbon, tetrachloride | lb. | .05¼ @ | .06 |
| Dichlorethylene | lb. | .29 @ | — |
| Dipentene, cml., drums | gal. | .41 @ | .44 |
| Dryolene (f.o.b. Okla.) | gal. | .10 @ | .10½ |
| Ethylene dichloride | lb. | .05½ @ | .06½ |
| Gasoline, steel bbls. | gal. | .16 @ | — |
| Naphtha, solvent | gal. | .31 @ | — |
| Plastogen | lb. | | |
| Reogen | lb. | | |
| Rub-Sol (f.o.b. Okla.) | gal. | .09 @ | — |
| Trichlorethylene | lb. | — @ | .09½ |
| Turpentine, spirits | gal. | .50 @ | — |
| dest. dist., drums | gal. | .47 @ | — |
| **Waxes** | | | |
| Beeswax, white | lb. | .34 @ | .35 |
| Carnauba, yellow | lb. | .45 @ | .46½ |
| Ceresin, white, dom. | lb. | .08 @ | .11 |
| Montan, crude | lb. | .10¾ @ | .11¾ |
| **Paraffin (c.l.—f.o.b. N. Y.)** | | | |
| Yellow crude scale | lb. | .03½ @ | — |
| White crude scale 124/126 | lb. | .03 @ | — |
| Refined, 122/127 | lb. | .04½ @ | — |

## ANTI-OXIDANTS

| | | | |
|---|---|---|---|
| AgeRite, Gel | lb. | | |
| HP | lb. | | |
| Powder | lb. | | |
| Resin | lb. | | |
| White | lb. | | |
| Albasan | lb. | .70 @ | .75 |
| Antox | lb. | | |
| B-L-E | lb. | .57 @ | .60 |
| Flectol-H | lb. | — @ | — |
| Flectol White | lb. | — @ | — |
| Flectol B | lb. | — @ | — |
| Neozone | lb. | | |
| Oxynone | lb. | .66 @ | .90 |
| Retardex | lb. | .35 @ | .40 |
| Stabilite | lb. | .57 @ | .62 |
| Stabilite Alba | lb. | .70 @ | .75 |
| VGB | lb. | .55 @ | .60 |

## MOLD LUBRICANTS

| | | | |
|---|---|---|---|
| Aresklene | lb. | — @ | — |
| Cocoa Soapstock | lb. | .06 @ | .08 |
| Dipex | lb. | .06 @ | .08 |
| Laurex | lb. | .24 @ | .30 |
| Rusco, f.o.b. Nitro | lb. | .12 @ | .30 |
| Sericite, f.o.b. N. Y. | ton | 65.00 @ | — |
| Soap Tree Bark, cut, sifted | lb. | .06 @ | .08 |
| Zip (Mold Wash) | lb. | — @ | — |

## FACTICE OR RUBBER SUBSTITUTES

| | | | |
|---|---|---|---|
| Amberex | lb. | .26 @ | — |
| Black | lb. | .08½ @ | — |
| White | lb. | .08½ @ | .13 |
| Brown | lb. | .08 @ | .14 |
| Duphax | lb. | .11 @ | — |

## VULCANIZING INGREDIENTS

| | | | |
|---|---|---|---|
| Sulfur Chloride, yellow (drs.) | lb. | .03½ @ | .04½ |
| Sulfur flour, | | | |
| Refined, 100% pure (bags) | cwt. | 2.55 @ | 3.15 |
| Commercial (bags) | cwt. | 1.60 @ | 2.35 |
| Telloy | lb. | | |
| Vandex | lb. | | |

Crude Rubber
Latex and Guayule
Reclaimed Rubber
Tires and Tubes

# STATISTICS OF THE INDUSTRY

Rim Production
Automobiles
Gasoline
Cotton Prices

## U. S. Imports and Exports of Crude Rubber

| YEARS | Gross Imports: Long Tons | Gross Imports: Total Declared Value | Gross Imports: Average Declared Value per pound Cents | Re-exports: Long Tons | Re-exports: Total Declared Value | Re-exports: Average Declared Value per pound Cents | Net Imports: Long Tons |
|---|---|---|---|---|---|---|---|
| 1922 | 301,075 | 101,843,188 | 15.10 | 4,809 | 1,921,828 | 17.84 | 296,267 |
| 1923 | 309,144 | 185,060,304 | 26.72 | 8,772 | 5,672,319 | 28.87 | 300,372 |
| 1924 | 328,056 | 174,231,331 | 23.71 | 10,309 | 6,057,637 | 26.23 | 317,747 |
| 1925 | 396,642 | 429,705,014 | 48.36 | 14,827 | 19,847,753 | 59.76 | 381,815 |
| 1926 | 413,338 | 505,817,807 | 54.63 | 17,671 | 22,470,583 | 56.77 | 395,667 |
| 1927 | 426,258 | 339,874,774 | 35.60 | 27,775 | 24,735,488 | 39.76 | 398,483 |
| 1928 | 439,731 | 244,854,973 | 25.03 | 32,159 | 18,128,361 | 25.17 | 407,572 |
| 1929 | 560,084 | 239,178,783 | 19.15 | 36,485 | 16,868,733 | 20.64 | 523,599 |
| 1930 | 482,082 | 139,134,330 | 12.89 | 30,205 | 9,316,205 | 13.77 | 451,877 |
| 1931 | 497,138 | 72,918,949 | 6.54 | 25,595 | 4,255,472 | 7.42 | 471,543 |
| 1932 | 409,584 | 31,936,459 | 3.47 | 20,929 | 2,015,612 | 4.30 | 388,655 |
| 1933 | 407,817 | 44,034,064 | 4.82 | 20,537 | 2,601,352 | 5.65 | 427,280 |
| 1934 | 449,322 | 97,898,519 | 9.73 | 23,848 | 5,770,109 | 11.23 | 425,615 |
| 1935 | 453,135 | 115,299,448 | 11.36 | 11,389 | 3,084,331 | 12.09 | 441,746 |
| 1934: | | | | | | | |
| July | 41,443 | 9,670,617 | 10.41 | 2,366 | 660,199 | 13.99 | 39,077 |
| August | 31,531 | 7,873,690 | 11.15 | 1,393 | 400,433 | 12.83 | 30,138 |
| Sept. | 31,074 | 8,293,859 | 11.92 | 1,665 | 474,446 | 12.72 | 29,409 |
| Oct. | 28,318 | 8,203,447 | 12.93 | 2,058 | 620,754 | 13.46 | 26,260 |
| Nov. | 36,325 | 10,470,076 | 12.87 | 1,230 | 327,672 | 11.89 | 35,095 |
| Dec. | 17,590 | 4,974,374 | 12.62 | 866 | 240,780 | 12.46 | 16,724 |
| 1935: | | | | | | | |
| Jan. | 39,675 | 10,852,388 | 12.21 | 977 | 278,229 | 12.72 | 38,698 |
| Feb. | 47,271 | 12,291,242 | 11.61 | 1,845 | 480,440 | 11.62 | 45,426 |
| March | 45,350 | 11,801,152 | 11.62 | 1,868 | 486,379 | 11.62 | 43,482 |
| April | 39,735 | 10,096,487 | 11.34 | 1,096 | 285,903 | 11.64 | 38,639 |
| May | 29,278 | 7,171,025 | 10.98 | 793 | 202,402 | 11.39 | 28,485 |
| June | 31,240 | 7,523,598 | 10.75 | 524 | 153,595 | 13.10 | 30,716 |
| July | 46,987 | 11,666,577 | 11.08 | 489 | 132,173 | 12.06 | 46,498 |
| August | 40,249 | 10,419,056 | 11.56 | 476 | 130,464 | 12.23 | 39,773 |
| Sept. | 34,659 | 8,637,048 | 11.12 | 468 | 120,438 | 11.48 | 34,191 |
| Oct. | 35,091 | 8,742,222 | 11.12 | 651 | 188,518 | 12.92 | 34,440 |
| Nov. | 25,050 | 6,137,160 | 10.94 | 380 | 101,793 | 11.95 | 24,670 |
| Dec. | 38,417 | 9,930,710 | 11.54 | 1,821 | 523,997 | 12.85 | 36,596 |
| 1936: | | | | | | | |
| Jan. | 32,255 | 8,624,060 | 11.94 | 732 | 229,129 | 13.98 | 31,523 |
| Feb. | 32,879 | 9,293,711 | 12.62 | 625 | 199,956 | 14.27 | 32,254 |
| Mar. | 34,911 | 10,271,085 | 13.13 | 1,172 | 390,551 | 14.88 | 33,739 |
| April | 45,933 | 14,509,230 | 14.10 | 984 | 343,785 | 15.59 | 44,949 |
| May | 37,133 | 11,967,624 | 14.39 | 1,589 | 580,021 | 16.30 | 35,544 |

* Revised.
Note: Total 1935 figures (revised) subject to further revision.

## United States Imports of Guayule, Balata, Jelutong, Liquid Latex

*(All Quantities in Long Tons)*

| | Guayule: Tons | Guayule: Dollars | Balata: Tons | Balata: Dollars | Jelutong: Tons | Jelutong: Dollars | Liquid Latex (1): Tons | Liquid Latex (1): Dollars |
|---|---|---|---|---|---|---|---|---|
| 1924 | 1,356 | 536,392 | 464 | a568,456 | 6,165 | 1,237,100 | 2,157 | 864,059 |
| 1925 | 3,781 | 1,803,448 | 517 | 574,750 | 6,749 | 1,642,531 | 3,853 | 3,537,810 |
| 1926 | 4,305 | 2,562,096 | 354 | 327,213 | 7,263 | 3,127,757 | 3,388 | 4,680,386 |
| 1927 | 5,018 | 2,674,957 | 582 | 447,246 | 7,785 | 2,448,657 | 1,116 | 876,077 |
| 1928 | 3,075 | 1,755,685 | 731 | 430,855 | 7,552 | 2,540,059 | 4,167 | 2,185,579 |
| 1929 | 1,231 | 545,175 | 728 | 566,964 | 8,203 | 2,458,136 | 3,728 | 1,787,997 |
| 1930 | 1,096 | 347,388 | 501 | 422,684 | 5,907 | 1,403,244 | 4,449 | 1,506,804 |
| 1931 | — | — | 1,208 | 411,692 | 5,777 | 1,019,010 | 4,650 | 884,355 |
| 1932 | — | — | 708 | 147,403 | 4,607 | 616,596 | 5,085 | 601,999 |
| 1933 | — | — | 1,658 | 2,261,869 | 5,989 | 944,895 | 11,085 | 1,833,671 |
| 1934 | 402 | 75,349 | 1,054 | 438,209 | 4,988 | 943,752 | 13,070 | 3,633,253 |
| 1935 | 468 | 86,835 | 626 | 188,384 | 5,747 | 1,063,126 | 13,553 | 3,782,222 |
| 1935: | | | | | | | | |
| May | 51 | 9,464 | 62 | 12,931 | 332 | 51,805 | 1,427 | 380,844 |
| June | 105 | 19,502 | 75 | 23,809 | 330 | 50,165 | 591 | 152,665 |
| July | 51 | 9,800 | 49 | 15,758 | 388 | 62,736 | 1,144 | 303,518 |
| August | 50 | 9,464 | 31 | 8,963 | 445 | 82,179 | 1,234 | 370,431 |
| Sept. | 18 | 3,245 | 29 | 6,090 | 1,682 | 407,418 | 1,048 | 291,652 |
| Oct. | 48 | 8,112 | 27 | 7,641 | 208 | 33,262 | 1,287 | 342,101 |
| Nov. | 70 | 11,931 | 39 | 11,706 | 269 | 50,657 | 1,023 | 261,668 |
| Dec. | 91 | 15,317 | 62 | 18,269 | 414 | 71,885 | 1,395 | 391,386 |
| 1936: | | | | | | | | |
| Jan. | 70 | 13,182 | 30 | 8,924 | 656 | 133,948 | 1,667 | 474,682 |
| Feb. | 75 | 14,127 | 100 | 34,389 | 396 | 84,635 | 1,459 | 406,985 |
| Mar. | 40 | 7,605 | 65 | 25,590 | 378 | 70,560 | 1,427 | 417,704 |
| April | 103 | 19,469 | 38 | 15,232 | 751 | 146,548 | 1,612 | 522,049 |
| May | 88 | 16,698 | 59 | 21,217 | 521 | 114,099 | 1,472 | 490,769 |

(1) Weight given in pounds of dry rubber contained in latex.
Note: Total 1935 figures (revised) subject to further revision.

## U. S. Consumption of Crude Rubber

*(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)*
*(All Quantities in Long Tons)*

| | 1929 | 1930 | 1931 | 1932 | 1933 | 1934 | 1935 | 1936 |
|---|---|---|---|---|---|---|---|---|
| Jan. | 43,002 | 36,194 | 28,557 | 29,648 | 22,645* | 39,190* | 47,103 | 48,506 |
| Feb. | 41,594 | 33,302 | 28,797 | 31,821 | 21,392* | 40,515* | 43,187 | 36,746 |
| Mar. | 44,730 | 35,540 | 32,788 | 29,505 | 17,483* | 47,003* | 42,620 | 42,703 |
| Apr. | 47,521 | 39,686 | 33,321 | 27,518 | 25,928 | 44,853* | 44,247* | 51,897 |
| May | 49,233 | 39,386 | 37,817 | 30,957 | 44,074 | 42,918* | 41,101* | 50,482 |
| June | 43,227 | 34,195 | 37,916 | 41,475 | 50,743* | 40,147* | 36,623 | |
| July | 41,526 | 29,508 | 31,397 | 29,976 | 49,614* | 32,553* | 36,384 | |
| Aug. | 38,274 | 30,850 | 27,586 | 23,721 | 44,428* | 33,216* | 39,242 | |
| Sept. | 34,707 | 25,515 | 23,638 | 23,847 | 35,281* | 30,258* | 37,553 | |
| Oct. | 34,800 | 27,516 | 22,277 | 22,286 | 31,543* | 31,253* | 42,436 | |
| Nov. | 27,659 | 23,691 | 22,943 | 23,231 | 28,831* | 34,748* | 42,778 | |
| Dec. | 25,531 | 21,687 | 21,409 | 18,015 | 28,757* | 36,569* | 42,942 | |
| Tot. | 469,804 | 375,980 | 348,986 | 332,000 | 400,719* | 453,223* | 496,216* | |

* Revised.

## Reclaimed Rubber in the United States

*(All Quantities in Long Tons)*

| Year | Production | Consumption: Tons | Consumption: % to Crude | Stocks* | Year | Production | Consumption: Tons | Consumption: % to Crude | Stocks* |
|---|---|---|---|---|---|---|---|---|---|
| 1926 | 180,582 | 164,500 | 45.9 | 23,213 | 1931 | 133,351 | 124,126 | 33.9 | 19,257 |
| 1927 | 189,144 | 178,471 | 47.6 | 24,980 | 1932 | 75,608 | 77,504 | 23.4 | 16,354 |
| 1928 | 208,516 | 223,000 | 50.4 | 24,785 | 1933 | 99,560 | 81,602 | 19.9 | 20,746 |
| 1929 | 218,954 | 226,588 | 48.4 | 27,464 | 1934 | 110,010 | 100,597 | 22.2 | 23,079 |
| 1930 | 157,967 | 153,497 | 40.8 | 22,006 | 1935 | 122,948 | 112,712 | 22.7 | 25,069 |

**Figures on Monthly Basis**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1935: | | | | | | | | | |
| Jan. | 10,465 | 11,261 | 23.9 | 22,291 | July | 8,421 | 8,396 | 23.1 | 17,810 |
| Feb. | 10,072 | 9,374 | 23.3 | 22,989 | Aug. | 9,557 | 8,795 | 22.4 | 18,272 |
| Mar. | 10,549 | 9,741 | 22.9 | 20,637 | Sept. | 9,041 | 8,764 | 23.4 | 18,260 |
| Apr. | 10,315 | 10,466 | 23.4 | 18,716a | Oct. | 11,926 | 9,662 | 22.8 | 19,640 |
| May | 10,223 | 9,938 | 23.9 | 18,541 | Nov. | 11,482 | 9,084 | 21.2 | 21,478 |
| June | 8,590 | 8,710 | 23.8 | 17,932 | Dec. | 12,307 | 8,521 | 19.8 | 25,069 |
| 1936: | | | | | | | | | |
| Jan. | 11,665 | 10,039 | 20.7 | 26,145 | July | ..... | ..... | ... | ..... |
| Feb. | 10,188 | 7,366 | 20.1 | 28,267 | Aug. | ..... | ..... | ... | ..... |
| Mar. | 10,712 | 8,767 | 20.5 | 29,161 | Sept. | ..... | ..... | ... | ..... |
| April | 11,382 | 10,333 | 19.9 | 22,274 | Oct. | ..... | ..... | ... | ..... |
| May | 11,512 | 10,396 | 20.6 | 22,852 | Nov. | ..... | ..... | ... | ..... |
| June | ..... | ..... | ... | ..... | Dec. | ..... | ..... | ... | ..... |

* Stocks on hand at the end of month or year.
a Revised.

## U. S. Consumption of Gasoline

*(Bureau of Mines Statistics)*
*(In Thousands of Barrels of 42 Gallons)*

| | 1934* | 1935* | 1936 | | 1934* | 1935* | 1936 |
|---|---|---|---|---|---|---|---|
| January .... | 29,489 | 28,062 | 32,553 | August .... | 39,105 | 42,836 | |
| February ... | 25,310 | 26,432 | 27,401 | September .. | 34,669 | 37,862 | |
| March ..... | 30,577 | 31,997 | 35,871 | October ... | 37,674 | 41,401 | |
| April ..... | 32,736 | 36,082 | 38,825 | November .. | 34,998 | 35,956 | |
| May ..... | 38,071 | 39,095 | | December .. | 30,581 | 33,734 | |
| June ..... | 36,430 | 37,890 | | | | | |
| July ..... | 37,466 | 41,209 | | Total | 407,106 | 432,556 | |

* Revised on basis of final annual figures issued by Bureau of Mines.

## Rims Inspected and Passed in U. S.

*(Tire and Rim Association Reports)*

| | Total | | Total | | Total |
|---|---|---|---|---|---|
| 1924 ..... | 21,863,311 | 1928 ..... | 24,247,282 | 1932 ..... | 6,261,336 |
| 1925 ..... | 26,001,664 | 1929 ..... | 24,141,502 | 1933 ..... | 8,713,962 |
| 1926 ..... | 24,199,524 | 1930 ..... | 17,364,096 | 1934 ..... | 12,255,118 |
| 1927 ..... | 19,700,003 | 1931 ..... | 11,253,800 | 1935 ..... | 18,664,356 |

| 1936: | | 1936: | | 1936: | |
|---|---|---|---|---|---|
| January ... | 1,877,448 | May ..... | 1,959,425 | September .. | ..... |
| February .. | 1,260,590 | June ..... | ..... | October ... | ..... |
| March ..... | 1,840,723 | July ..... | ..... | November .. | ..... |
| April ..... | 2,258,296 | August .... | ..... | December .. | ..... |

## Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | Ave. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1934 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| March | 10 7/8 | 10 1/2 | 10 1/2 | 10 3/8 | 10 3/8 | 10 3/8 | 10 3/8 | 10 1/8 | 11 1/8 | 11 1/8 | 11 | 11 5/8 | 11 5/8 | 11 3/4 | 11 3/4 | 11 5/8 | 11 5/8 | 12 3/8 | 10 7/8 | 11 1/8 | 10 7/8 | 11 1/8 | 10 1/8 | 11 1/8 | 12 1/8 | 10 1/8 | 10 7/8 | 11 7/8 | 12 1/8 | 13 3/8 | — | 11 |
| April | 11 3/4 | 11 3/4 | 11 3/4 | 11 1/2 | 11 1/2 | 11 1/2 | 11 7/8 | 11 7/8 | 11 7/8 | 11 3/4 | 11 3/4 | 11 3/4 | 12 | 12 | 12 | 12 | 12 1/8 | 12 1/8 | 12 3/8 | 12 1/2 | 12 3/8 | 12 1/8 | 12 1/2 | 12 3/8 | 12 1/2 | 12 3/8 | 12 3/8 | 12 1/8 | 12 1/8 | 13 3/8 | — | 12 3/8 |
| May | 14 3/4 | 14 3/8 | 14 7/8 | 12 3/4 | 13 | 13 | 13 1/2 | 13 3/4 | 14 | 13 3/4 | 13 3/4 | 13 3/4 | 13 3/4 | 13 3/4 | 13 1/2 | 13 3/8 | 13 3/8 | 13 | 13 | 13 1/2 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/4 | 13 3/4 | 13 3/4 | 13 3/4 | 13 3/4 | 14 | 13 3/8 | 13 1/2 | 13 3/4 |
| June | 13 | 13 | 13 | 13 | 13 | 13 1/4 | 13 1/4 | 13 1/4 | 13 1/4 | 13 1/4 | 13 1/4 | 13 1/4 | 13 1/4 | 13 1/4 | 13 1/2 | 13 1/2 | 13 1/2 | 13 1/2 | 13 1/2 | 13 1/2 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/4 | 13 3/4 | 13 3/4 | 13 3/4 | 13 3/4 | 13 3/4 | 13 3/4 | 13 3/4 | 13 3/4 | 13 3/4 |
| July | 14 | 14 3/8 | 14 3/8 | — | 14 3/4 | 14 3/4 | 14 3/4 | 14 3/4 | 14 3/4 | 14 3/4 | 14 3/4 | 14 3/4 | 14 3/8 | 14 3/8 | 14 3/8 | 14 3/8 | 14 3/8 | 14 3/8 | 14 3/8 | 14 3/8 | 14 3/8 | 14 3/8 | 14 3/8 | 14 3/8 | 14 3/8 | 14 3/8 | 14 3/8 | 14 3/8 | 14 3/8 | 14 3/8 | 14 3/8 | 14 3/8 |
| August | 14 1/8 | 14 3/8 | 15 | — | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| September | — | 15 1/2 | — | 15 3/8 | 15 1/8 | 15 3/8 | 15 3/8 | 15 3/8 | 15 3/8 | 15 3/8 | 15 1/8 | 15 1/8 | 15 3/8 | 15 3/8 | 15 3/8 | 15 3/8 | 15 3/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 |
| October | — | 14 1/2 | 13 7/8 | 14 | 13 3/8 | — | — | 14 | 13 3/8 | 13 3/4 | — | — | — | — | — | — | 14 | 14 1/8 | — | — | — | — | 14 1/8 | 13 7/8 | 13 7/8 | — | — | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 |
| November | 13 3/8 | 13 3/8 | 13 | 13 | 13 | 13 | 13 3/8 | 13 3/8 | — | 13 3/4 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 |
| December | 13 3/8 | — | 12 7/8 | 13 | 13 | 13 3/8 | 13 3/8 | 13 3/8 | — | 13 3/4 | 12 7/8 | 12 7/8 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 12 1/2 | 12 1/8 | 12 1/8 | 13 | 13 | 13 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 |
| 1935 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| January | — | 13 3/8 | 13 1/2 | 13 1/2 | 13 1/2 | — | 13 3/4 | 13 3/4 | 13 5/8 | 13 3/4 | 13 3/4 | 13 3/4 | — | 13 3/4 | 12 7/8 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| February | — | 13 3/4 | 13 3/4 | 13 3/4 | 13 3/4 | 12 5/8 | 12 5/8 | 13 7/8 | 13 7/8 | 13 7/8 | 13 7/8 | 13 7/8 | 13 7/8 | 13 7/8 | 13 7/8 | 13 7/8 | 13 7/8 | 13 7/8 | 13 7/8 | 13 7/8 | 13 7/8 | 13 7/8 | 13 7/8 | 13 7/8 | 13 7/8 | 13 7/8 | 13 7/8 | 13 7/8 | 13 7/8 | 13 7/8 | 13 7/8 | 13 7/8 |
| March | — | 12 3/4 | 12 3/4 | 12 3/4 | 12 3/4 | 12 | 12 | 12 3/4 | 12 | 12 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 |
| April | — | 11 3/8 | 11 3/8 | 11 | 11 | 11 | — | 10 1/8 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 |
| May | — | 11 3/8 | 11 3/8 | 11 1/2 | 11 1/2 | 11 | 11 1/2 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 |
| June | — | 12 1/8 | 12 1/4 | 12 1/2 | 12 1/2 | 11 1/2 | 12 1/2 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 |
| July | — | 12 1/4 | 12 1/4 | 12 1/4 | 12 1/4 | 12 1/4 | 12 1/4 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 | 12 3/8 |
| August | — | 12 1/4 | 12 1/4 | 11 7/8 | 11 7/8 | 11 7/8 | 11 7/8 | 11 7/8 | 12 | 11 7/8 | 11 7/8 | 11 7/8 | 11 7/8 | 11 7/8 | 11 7/8 | 11 7/8 | 11 7/8 | 11 7/8 | 11 7/8 | 11 7/8 | 11 7/8 | 11 7/8 | 11 7/8 | 11 7/8 | 11 7/8 | 11 7/8 | 11 7/8 | 11 7/8 | 11 7/8 | 11 7/8 | 11 7/8 | 11 7/8 |
| September | — | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 |
| October | — | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 | 11 3/8 |
| November | — | 13 3/4 | 13 3/4 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/4 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 |
| December | — | 13 7/8 | 12 3/4 | 12 3/8 | 13 | 13 3/8 | 13 3/8 | 13 3/8 | — | 13 3/4 | 13 3/8 | 13 3/8 | 13 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 | 13 3/8 |
| 1936 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| January | — | 13 1/2 | 13 5/8 | 13 5/8 | — | 13 3/4 | 13 3/8 | 13 1/8 | 13 5/8 | 14 | 15 3/8 | 16 | 14 7/8 | 14 7/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 | 15 1/8 |
| February | — | 15 1/8 | 15 5/8 | 15 5/8 | 15 5/8 | 15 5/8 | 15 5/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 |
| March | — | 15 1/8 | 15 5/8 | 15 5/8 | 15 5/8 | 15 5/8 | 15 5/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 |
| April | — | 15 1/8 | 15 5/8 | 15 5/8 | 15 5/8 | 15 5/8 | 15 5/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 |
| May | — | 15 1/8 | 15 5/8 | 15 5/8 | 15 5/8 | 15 5/8 | 15 5/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 |
| June | — | 15 1/8 | 15 5/8 | 15 5/8 | 15 5/8 | 15 5/8 | 15 5/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 | 15 7/8 |
| July | — | 16 1/8 | 16 1/8 | 16 1/8 | 16 1/8 | 16 1/8 | 16 1/2 | 16 1/8 | 16 1/8 | 16 1/8 | 16 1/8 | 16 1/8 | 16 1/8 | 16 1/8 | 16 1/8 | 16 1/8 | 16 1/8 | 16 1/8 | 16 1/8 | 16 1/8 | 16 1/8 | 16 1/8 | 16 1/8 | 16 1/8 | 16 1/8 | 16 1/8 | 16 1/8 | 16 1/8 | 16 1/8 | 16 1/8 | 16 1/8 | 16 1/8 |

# Average Spot Closing Prices—Ribbed Smoked Sheets

*(New York Market)*

### Average Price per Pound for Years 1910-1929

| Year | Cents | Year | Cents | Year | Cents | Year | Cents | Year | Cents |
|---|---|---|---|---|---|---|---|---|---|
| 1910 | 206.60 | 1914 | 65.33 | 1918 | 60.15 | 1922 | 17.50 | 1926 | 48.50 |
| 1911 | 141.30 | 1915 | 65.85 | 1919 | 48.70 | 1923 | 29.45 | 1927 | 37.72 |
| 1912 | 121.60 | 1916 | 72.50 | 1920 | 36.30 | 1924 | 26.20 | 1928 | 22.48 |
| 1913 | 82.04 | 1917 | 72.23 | 1921 | 16.36 | 1925 | 72.46 | 1929 | 20.55 |

### Average Monthly Price per Pound Since 1930

| | 1930 Cents | 1931 Cents | 1932 Cents | 1933 Cents | 1934 Cents | 1935 Cents | 1936 Cents |
|---|---|---|---|---|---|---|---|
| Jan. | 15.24 | 8.34 | 4.38 | 3.08 | 9.32 | 13.10 | 14.35 |
| Feb. | 15.85 | 7.70 | 4.03 | 2.95 | 10.45 | 12.92 | 15.48 |
| Mar. | 15.34 | 7.71 | 3.35 | 3.01 | 11.01 | 11.51 | 15.89 |
| Apr. | 14.93 | 6.43 | 3.02 | 3.56 | 12.10 | 11.55 | 15.98 |
| May | 14.24 | 6.49 | 3.09 | 4.95 | 13.26 | 12.05 | 15.62 |
| June | 12.45 | 6.35 | 2.66 | 6.15 | 13.51 | 12.57 | 15.85 |
| July | 11.24 | 6.37 | 2.89 | 8.01 | 14.60 | 12.10 | |
| Aug. | 9.96 | 5.38 | 3.63 | 7.31 | 15.47 | 11.98 | |
| Sept. | 8.28 | 5.08 | 3.84 | 7.30 | 15.36 | 11.55 | |
| Oct. | 8.20 | 4.87 | 3.65 | 7.64 | 13.96 | 12.62 | |
| Nov. | 9.01 | 4.65 | 3.44 | 8.66 | 13.04 | 13.15 | |
| Dec. | 9.05 | 4.64 | 3.24 | 8.87 | 12.98 | 13.28 | |
| Average for Year | 11.98 | 6.17 | 3.49 | 5.96 | 12.92 | 12.37 | |

# London Closing Prices of Ribbed Smoked Sheets

*(In Pence Per Pound)*

| Day | 1936 Apr. | 1936 May | 1936 June | 1936 July | Day | 1936 Apr. | 1936 May | 1936 June | 1936 July |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 7 3/8 | 7 7/8 | — | 7 7/8 | 17 | 7 7/8 | — | 7 7/8 | |
| 2 | 7 7/8 | 7 1/2 | 7 1/4 | 7 1/8 | 18 | 7 1/8 | 7 3/8 | 7 7/8 | |
| 3 | 7 1/2 | — | 7 1/4 | 7 1/8 | 19 | — | 7 5/8 | 7 7/8 | |
| 4 | 7 1/2 | 7 3/8 | 7 1/8 | — | 20 | 7 5/8 | 7 7/8 | — | |
| 5 | — | 7 3/8 | 7 1/4 | — | 21 | 7 7/8 | 7 7/8 | — | |
| 6 | 7 1/2 | 7 3/8 | 7 1/4 | 7 1/4 | 22 | 7 1/2 | 7 7/8 | 7 3/8 | |
| 7 | 7 1/2 | 7 1/4 | — | 7 3/4 | 23 | 7 7/8 | 7 3/8 | 7 1/8 | |
| 8 | 7 7/8 | 7 1/4 | 7 3/8 | 7 3/4 | 24 | 7 1/2 | — | 7 1/2 | |
| 9 | 7 7/8 | 7 1/4 | 7 1/8 | | 25 | 7 7/8 | 7 3/8 | 7 1/2 | |
| 10 | — | — | 7 1/8 | | 26 | — | 7 7/8 | 7 1/2 | |
| 11 | — | 7 1/4 | 7 1/8 | | 27 | 7 1/2 | 7 1/4 | — | |
| 12 | — | 7 1/4 | 7 3/8 | | 28 | 7 3/8 | 7 7/8 | — | |
| 13 | — | 7 1/4 | — | | 29 | 7 1/2 | 7 7/8 | 7 7/8 | |
| 14 | 7 7/8 | 7 3/8 | — | | 30 | 7 7/8 | — | 7 7/8 | |
| 15 | 7 7/8 | 7 3/8 | 7 5/8 | | 31 | — | — | — | |
| 16 | 7 3/8 | 7 1/8 | 7 7/8 | | | | | | |

### Average Monthly Price Per Pound

| Month | 1933 Pence | 1934 Pence | 1935 Pence | 1936 Pence | Month | 1933 Pence | 1934 Pence | 1935 Pence | 1936 Pence |
|---|---|---|---|---|---|---|---|---|---|
| Jan. | 2.264 | 4.429 | 6.434 | 6.758 | Aug. | 3.811 | 7.401 | 5.696 | |
| Feb. | 2.093 | 4.920 | 6.292 | 7.255 | Sept. | 3.728 | 7.409 | 5.508 | |
| Mar. | 2.099 | 5.136 | 5.745 | 7.450 | Oct. | 3.957 | 6.806 | 6.130 | |
| Apr. | 2.323 | 5.712 | 5.604 | 7.502 | Nov. | 4.096 | 6.294 | 6.308 | |
| May | 2.966 | 6.207 | 5.822 | 7.335 | Dec. | 4.200 | 6.295 | 6.340 | |
| June | 3.392 | 6.245 | 6.027 | 7.352 | Average for Year | 3.233 | 6.159 | 5.976 | |
| July | 3.860 | 7.053 | 5.801 | | | | | | |

# Spot Closing Cotton Prices

*(Middling Upland Grade—New York Market)*

### Recent Daily Price Per Pound

| Date | 1936 May | 1936 June | 1936 July | Date | 1936 May | 1936 June | 1936 July | Date | 1936 May | 1936 June | 1936 July |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 11.61 | 11.79 | 12.50 | 11 | 11.63 | 11.79 | | 22 | 11.69 | 12.41 | |
| 2 | 11.61 | 11.80 | 12.51 | 12 | 11.63 | 11.80 | | 23 | 11.74 | 12.23 | |
| 3 | — | 11.80 | 12.49 | 13 | 11.63 | 11.80 | | 24 | — | 12.16 | |
| 4 | 11.62 | 11.77 | — | 14 | 11.66 | — | | 25 | 11.72 | 12.26 | |
| 5 | 11.62 | 11.80 | — | 15 | 11.73 | 11.79 | | 26 | 11.73 | 12.43 | |
| 6 | 11.63 | 11.78 | 12.62 | 16 | 11.72 | 11.85 | | 27 | 11.74 | 12.49 | |
| 7 | 11.65 | — | 12.69 | 17 | — | 11.98 | | 28 | 11.76 | — | |
| 8 | 11.67 | 11.78 | 13.23 | 18 | 11.72 | 12.00 | | 29 | 11.77 | 12.39 | |
| 9 | 11.65 | 11.79 | | 19 | 11.72 | 12.23 | | 30 | — | 12.33 | |
| 10 | — | 11.79 | | 20 | 11.72 | 12.32 | | 31 | — | — | |
| | | | | 21 | 11.72 | — | | | | | |

### Average Monthly Price Per Pound

| | 1933 Cents | 1934 Cents | 1935 Cents | 1936 Cents | | 1933 Cents | 1934 Cents | 1935 Cents | 1936 Cents |
|---|---|---|---|---|---|---|---|---|---|
| Jan. | 6.23 | 11.25 | 12.70 | 11.91 | Aug. | 9.55 | 13.40 | 11.48 | |
| Feb. | 6.05 | 12.28 | 12 58 | 11.53 | Sept. | 9.64 | 13.00 | 10.80 | |
| Mar. | 6.39 | 12.30 | 11.63 | 11.43 | Oct. | 9.58 | 12.48 | 11.28 | |
| Apr. | 7.02 | 11.80 | 11.73 | 11.71 | Nov. | 10.04 | 12.53 | 12.01 | |
| May | 8.64 | 11.44 | 12.25 | 11.68 | Dec. | 10.17 | 12.76 | 11.99 | |
| June | 9.47 | 12.20 | 11.89 | 12.02 | Average for Year | 8.63 | 12.36 | 11.88 | |
| July | 10.76 | 12.84 | 12.26 | | | | | | |

# World Stocks of Crude Rubber

*(All figures are in long tons)*

## ON HAND OR AFLOAT TO THE U. S.

| At End of | ON HAND 1934 | ON HAND 1935 | ON HAND 1936 | AFLOAT 1934 | AFLOAT 1935 | AFLOAT 1936 | ON HAND AND AFLOAT 1934 | ON HAND AND AFLOAT 1935 | ON HAND AND AFLOAT 1936 |
|---|---|---|---|---|---|---|---|---|---|
| Jan. | 370,039 | 349,446 | 285,054* | 45,768 | 42,066 | 43,870 | 415,807 | 391,512 | 328,924* |
| Feb. | 358,423 | 340,264 | 282,902* | 53,063 | 42,969 | 46,532 | 411,486 | 383,233 | 329,434* |
| Mar. | 353,078 | 340,284 | 276,823* | 54,722 | 44,485 | 58,935 | 407,800 | 384,769 | 335,758* |
| Apr. | 351,073 | 337,586 | 264,228* | 56,251 | 37,651 | 47,678 | 407,324 | 375,237 | 311,906* |
| May | 350,935 | 322,558 | 248,317 | 57,921 | 44,375 | 48,860 | 408,856 | 366,933 | 297,177 |
| June | 358,461 | 324,218 | | 46,698 | 55,581 | | 405,159 | 379,799 | |
| July | 365,072 | 334,692 | | 45,869 | 49,018 | | 410,941 | 383,710 | |
| Aug. | 363,711 | 334,106 | | 40,278 | 47,724 | | 403,989 | 381,830 | |
| Sept. | 360,623 | 331,121 | | 38,831 | 43,413 | | 399,454 | 374,534 | |
| Oct. | 362,571 | 322,857 | | 38,247 | 49,913 | | 400,818 | 371,770 | |
| Nov. | 362,826 | 308,993 | | 38,625 | 46,588 | | 401,451 | 355,581 | |
| Dec. | 355,000 | 303,000 | | 47,644 | 39,094 | | 402,644 | 342,094 | |

(Rubber Manufacturers' Association figures raised to 100%)

* Revised.

Note: Complete figures for 1934 and 1935 were revised by the R.M.A. on May 1, 1936.

## STOCKS IN GREAT BRITAIN

*(No. of Tons in Wharves and Warehouses, not including Latex)*

| At end of | London 1934 | London 1935 | London 1936 | Liverpool 1934 | Liverpool 1935 | Liverpool 1936 |
|---|---|---|---|---|---|---|
| January | 38,570 | 81,807 | 84,791 | 51,702 | 66,405 | 77,188 |
| February | 38,752 | 87,605 | 79,757 | 52,730 | 67,983 | 77,138 |
| March | 40,501 | 92,664 | 74,779 | 53,813 | 69,218 | 72,823 |
| April | 42,413 | 94,361 | 68,932 | 53,695 | 70,584 | 71,388 |
| May | 42,190 | 95,722 | 61,349 | 54,007 | 71,927 | 69,150 |
| June | 45,674 | 98,077 | | 54,028 | 73,131 | |
| July | 50,490 | 99,226 | | 55,414 | 74,915 | |
| August | 48,953 | 101,574 | | 56,246 | 75,584 | |
| September | 56,103 | 101,198 | | 56,848 | 76,263 | |
| October | 63,079 | 94,749 | | 57,818 | 76,400 | |
| November | 67,656 | 90,542 | | 60,106 | 76,301 | |
| December | 72,285 | 86,551 | | 62,505 | 77,589 | |

*(Figures from the Rubber Trade Association of London)*

## STOCKS IN OTHER CENTRES

*(Figures from Statistical Bulletin of the Int'l Rubber Regulation Committee)*

| At end of 1935 | Penang and Singapore [1] | Malaya [2] | Ceylon [3] | Holland | Para and Manaos |
|---|---|---|---|---|---|
| June | 51,770 | 38,209 | 4,271 | 1,481 | 4,036 |
| July | 49,958 | 39,140 | 4,700 | 1,448 | 4,441 |
| August | 46,482 | 34,541 | 4,866 | 1,455 | 4,571 |
| September | 33,872 | 33,489 | 4,403 | 1,442 | 4,673 |
| October | 37,597 | 34,271 | 3,790 | 1,440 | 4,346 |
| November | 32,597 | 34,197 | 4,393 | 1,550 | 4,062 |
| December | 28,304 | 33,899* | 4,794 | 1,553 | 4,683 |
| At end of 1936 | | | | | |
| January | 31,195 | 35,231* | 4,504* | 1,568 | 4,496 |
| February | 38,421 | 34,109 | 4,475 | 1,532 | 6,199 |
| March | 29,322 | 31,723 | 3,866 | 1,547 | 4,864 |
| April | 32,200 | 34,090 | 3,123 | | 4,873 |

[1] Dealers' and Port Stocks. [2] Inside Regulated Areas. [3] Dealers' Stocks Only.

* Revised.

## RUBBER STOCKS AFLOAT

| End of: 1935 | Afloat for United States | Afloat for Europe | All Other * Afloat | Total * Afloat |
|---|---|---|---|---|
| May | 44,375 | 30,300 | 29,325 | 104,000 |
| June | 55,581 | 27,485 | 17,934 | 101,000 |
| July | 49,018 | 29,150 | 17,832 | 96,000 |
| August | 47,724 | 32,800 | 21,476 | 102,000 |
| September | 43,413 | 31,090 | 26,497 | 101,000 |
| October | 49,913 | 29,000 | 20,087 | 99,000 |
| November | 46,588 | 26,250 | 16,162 | 89,000 |
| December | 39,094 | 25,200 | 18,706 | 83,000 |
| End of 1936: | | | | |
| January | 43,870 | 20,160 | 19,970 | 84,000 |
| February | 46,532 | 18,690 | 19,778 | 85,000 |
| March | 58,935 | 16,820 | 14,245 | 90,000 |
| April | 47,678 | 17,000 P | 18,322 | 83,000 |
| May | 48,860 | 18,000 P | 21,140 | 88,000 |

* *Total Afloat* is an arbitrary estimate based on 1½ months' shipments as adopted by the Department of Commerce. *All Other Afloat* is determined by subtracting the amount of stocks in transit to the United States and Europe from the estimated total.

P—Preliminary estimate.

## TOTAL WORLD STOCKS

*(Figures from the Survey of Current Business)*

| At end of | 1931 | 1932 | 1933 | 1934 | 1935 | 1936 |
|---|---|---|---|---|---|---|
| January | 510,296 | 638,416 | 634,797 | 661,948 | 698,153 | 600,479* |
| February | 516,123 | 626,819 | 626,227 | 663,308 | 686,195 | 599,355* |
| March | 532,080 | 629,894 | 638,428 | 666,382 | 678,809 | 574,594* |
| April | 531,832 | 630,803 | 629,159 | 658,796 | 677,006 | 558,583 |
| May | 528,855 | 627,474 | 626,537 | 689,239 | 677,569 | 532,411 |
| June | 533,021 | 595,712 | 613,055 | 672,804 | 671,525 | |
| July | 548,794 | 589,037 | 618,258 | 676,200 | 679,061 | |
| August | 555,931 | 597,274 | 617,449 | 674,702 | 680,644 | |
| September | 561,838 | 599,986 | 623,683 | 694,361 | 661,509 | |
| October | 588,873 | 609,368 | 636,597 | 680,616 | 655,000 | |
| November | 605,684 | 614,342 | 642,968 | 684,408 | 623,300 | |
| December | 628,826 | 629,898 | 654,890 | 705,975 | 611,987* | |
| Monthly Average | 553,513 | 615,752 | 630,171 | 677,395 | 666,729* | |

* Revised.

# U. S. Tire and Tube Statistics[1]

*(All Figures Represent Thousands)*

## AUTOMOBILE CASINGS

### Figures for Recent Years

| | 1928 | 1929 | 1930 | 1931 | 1932 | 1933 | 1934 | 1935 |
|---|---|---|---|---|---|---|---|---|
| Production | 77,944 | 68,726 | 50,965 | 48,739 | 40,085 | 45,304 | 47,233 | 49,362 |
| Shipments | 74,296 | 69,395 | 53,638 | 48,151 | 40,260 | 44,094 | 46,687 | 50,357 |
| Inventory [2] | 13,624 | 11,838 | 9,003 | 7,775 | 7,644 | 8,888 | 9,455 | 8,196 |

### Figures for Recent Months

| | PRODUCTION 1934 | PRODUCTION 1935 | PRODUCTION 1936 | SHIPMENTS 1934 | SHIPMENTS 1935 | SHIPMENTS 1936 | INVENTORY 1934 | INVENTORY 1935 | INVENTORY 1936 |
|---|---|---|---|---|---|---|---|---|---|
| Jan. | 3,922 | 4,626 | 4,579 | 3,222 | 3,663 | 3,875 | 9,684 | 10,398 | 8,918 |
| Feb. | 4,335 | 4,383 | 3,577 | 3,285 | 3,287 | 3,211 | 10,725 | 11,530 | 9,265 |
| Mar. | 5,180 | 4,346 | 3,638 | 4,223 | 4,204 | 3,856 | 11,651 | 11,675 | 9,087 |
| Apr. | 4,470 | 4,512 | 4,854 | 4,438 | 5,144 | 4,903 | 11,981 | 11,003 | 9,034 |
| May | 4,456 | 4,175 | | 5,332 | 4,067 | | 11,127 | 11,131 | |
| June | 4,342 | 3,910 | | 5,228 | 4,262 | | 10,219 | 10,755 | |
| July | 3,353 | 3,532 | | 4,157 | 5,447 | | 9,437 | 8,850 | |
| Aug. | 3,533 | 3,993 | | 4,308 | 4,739 | | 8,697 | 7,805 | |
| Sept. | 2,936 | 3,787 | | 3,183 | 3,303 | | 8,419 | 8,288 | |
| Oct. | 3,287 | 4,051 | | 3,010 | 4,095 | | 8,657 | 8,291 | |
| Nov. | 3,341 | 3,997 | | 3,191 | 3,990 | | 8,779 | 8,249 | |
| Dec. | 3,778 | 4,051 | | 3,109 | 4,154 | | 9,455 | 8,196 | |

## AUTOMOBILE INNER TUBES

### Figures for Recent Years

| | 1928 | 1929 | 1930 | 1931 | 1932 | 1933 | 1934 | 1935 |
|---|---|---|---|---|---|---|---|---|
| Production | 80,180 | 68,829 | 52,420 | 48,333 | 36,891 | 42,546 | 46,228 | 47,879 |
| Shipments | 77,127 | 70,592 | 54,938 | 50,021 | 37,911 | 41,391 | 45,046 | 48,241 |
| Inventory [2] | 16,117 | 12,807 | 9,999 | 7,922 | 6,749 | 7,815 | 9,180 | 8,231 |

### Figures for Recent Months

| | PRODUCTION 1934 | PRODUCTION 1935 | PRODUCTION 1936 | SHIPMENTS 1934 | SHIPMENTS 1935 | SHIPMENTS 1936 | INVENTORY 1934 | INVENTORY 1935 | INVENTORY 1936 |
|---|---|---|---|---|---|---|---|---|---|
| Jan. | 3,530 | 4,259 | 4,734 | 3,199 | 3,722 | 4,297 | 8,403 | 9,621 | 8,889 |
| Feb. | 4,077 | 4,171 | 3,666 | 3,323 | 3,362 | 3,552 | 8,445 | 10,466 | 8,968 |
| Mar. | 5,194 | 4,123 | 3,904 | 4,118 | 4,168 | 3,913 | 10,244 | 10,406 | 8,960 |
| Apr. | 4,735 | 4,259 | 4,973 | 4,342 | 4,453 | 4,893 | 10,585 | 10,170 | 9,060 |
| May | 4,359 | 3,892 | | 4,902 | 3,451 | | 10,043 | 10,615 | |
| June | 4,097 | 3,480 | | 5,309 | 4,024 | | 8,795 | 10,050 | |
| July | 3,531 | 3,251 | | 4,323 | 5,269 | | 8,053 | 8,005 | |
| Aug. | 3,680 | 3,894 | | 4,198 | 4,556 | | 7,555 | 6,939 | |
| Sept. | 3,110 | 4,125 | | 3,024 | 3,426 | | 7,639 | 7,565 | |
| Oct. | 3,219 | 4,435 | | 2,689 | 4,110* | | 8,151 | 8,053 | |
| Nov. | 3,169 | 3,942 | | 2,767 | 3,801* | | 8,503 | 8,161 | |
| Dec. | 3,503 | 4,048 | | 2,850 | 4,084* | | 9,180 | 8,231 | |

(1) Rubber Manufacturers' Association figures, raised to 100%. The Association estimates its figures to be 75% complete up until 1929 and 80% complete for 1929-1933. Beginning 1934, the Association reported its figures to be 97% complete.

(2) Held by manufacturers at end of period indicated.

(*) Revised.

# Automobile Production

| | United States Total | United States Passenger Cars | United States Trucks | Canada Total | Canada Passenger Cars | Canada Trucks | Grand Total |
|---|---|---|---|---|---|---|---|
| 1928 | 4,357,384 | 3,826,613 | 530,771 | 242,382 | 196,737 | 45,645 | 4,599,944 |
| 1929 | 5,358,420 | 4,587,400 | 771,020 | 263,295 | 207,498 | 55,797 | 5,621,715 |
| 1930 | 3,355,986 | 2,814,452 | 540,534 | 154,192 | 125,442 | 28,750 | 3,510,178 |
| 1931 | 2,389,730 | 1,973,090 | 416,640 | 82,621 | 63,477 | 19,144 | 2,472,351 |
| 1932 | 1,370,678 | 1,135,493 | 235,187 | 60,816 | 50,718 | 10,098 | 1,431,494 |
| 1933* | 1,920,057 | 1,573,512 | 346,545 | 65,924 | 53,855 | 12,069 | 1,992,126 |
| 1934* | 2,753,111 | 2,177,919 | 575,192 | 116,852 | 92,647 | 24,205 | 2,869,963 |
| 1935 | 4,009,496 | 3,285,836 | 723,660 | 172,995 | 139,742 | 33,253 | 4,182,491 |
| 1935 [1] | | | | | | | |
| May | 364,662 | 307,522 | 57,140 | 20,765 | 17,093 | 3,672 | 385,427 |
| June | 361,248 | 296,609 | 64,639 | 15,745 | 12,276 | 3,469 | 376,993 |
| July | 336,985 | 276,084 | 60,901 | 13,069 | 9,471 | 3,598 | 350,054 |
| Aug. | 239,994 | 182,389 | 57,605 | 7,692 | 5,524 | 2,168 | 247,686 |
| Sept. | 89,804 | 57,285 | 32,519 | 5,323 | 3,819 | 1,504 | 95,127 |
| Oct. | 275,024 | 214,609 | 60,415 | 8,313 | 7,128 | 1,185 | 283,337 |
| Nov. | 398,039 | 338,425 | 59,614 | 13,496 | 12,042 | 1,454 | 411,535 |
| Dec. | 407,804 | 344,613 | 63,191 | 13,775 | 11,370 | 2,405 | 421,579 |
| 1936 | | | | | | | |
| Jan.* | 364,004 | 298,274 | 65,730 | 13,302 | 11,261 | 2,041 | 377,306 |
| Feb.* | 287,606 | 224,816 | 62,790 | 13,268 | 10,853 | 2,415 | 300,874 |
| March* | 420,971 | 343,523 | 77,448 | 17,974 | 14,488 | 3,486 | 438,945 |
| April | 502,775 | 417,133 | 85,642 | 24,951 | 20,247 | 4,704 | 527,726 |
| May | 460,565 | 385,507 | 75,058 | 20,006 | 16,389 | 3,617 | 480,571 |

* Revised.

[1] Figures for the complete period of 1935 were revised by the Bureau of the Census, Department of Commerce, on January 24, 1936.

# Exports of Crude Rubber from Principal Producing Countries

(Long Tons)

| | BRITISH MALAYA [1] | | | | | | | DUTCH EAST INDIES [5] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gross Exports | Imports | Gross Exports Minus Imports | Ceylon [2] | India & Burma [3] | Sarawak [4] | British North Borneo [5] | Siam [6] | Java & Madura | Sumatra E. Coast | Other D.E.I. | Indo-China [3] | Amazon Valley | All Other [6] | World Total [7] |
| 1923 | 252,016 | 70,432 | 181,584 | 39,971 | 6,416 | 5,705 | 4,237 | 1,718 | 32,930 | 46,344 | 57,822 | 5,067 | 16,765 | 7,856 | 406,415 |
| 1924 | 259,706 | 108,524 | 151,182 | 39,997 | 7,657 | 6,699 | 4,621 | 2,962 | 42,446 | 54,497 | 80,347 | 6,688 | 23,165 | 9,065 | 429,366 |
| 1925 | 316,825 | 158,022 | 158,803 | 49,566 | 10,082 | 5,424 | 5,377 | 5,377 | 46,757 | 65,499 | 120,626 | 7,881 | 25,298 | 13,797 | 514,487 |
| 1926 | 391,328 | 151,243 | 240,085 | 58,962 | 9,874 | 9,155 | 6,079 | 4,027 | 52,186 | 71,413 | 121,231 | 8,203 | 24,298 | 16,017 | 621,530 |
| 1927 | 371,322 | 182,845 | 188,477 | 55,356 | 11,321 | 10,923 | 6,582 | 5,472 | 55,297 | 77,815 | 142,171 | 8,645 | 28,782 | 15,633 | 606,474 |
| 1928 | 409,430 | 149,787 | 259,643 | 57,267 | 10,790 | 10,087 | 6,698 | 4,813 | 58,848 | 82,511 | 121,770 | 9,548 | 21,129 | 10,690 | 653,794 |
| 1929 | 574,836 | 163,092 | 411,744 | 81,584 | 11,663 | 11,077 | 7,381 | 5,018 | 65,990 | 87,789 | 134,037 | 9,696 | 21,148 | 6,767 | 853,894 |
| 1930 | 547,043 | 133,876 | 413,167 | 76,970 | 10,782 | 10,309 | 6,781 | 4,251 | 69,735 | 79,396 | 115,254 | 7,665 | 14,260 | 5,651 | 814,241 |
| 1931 | 519,740 | 125,506 | 394,234 | 61,769 | 8,470 | 10,451 | 6,247 | 4,218 | 75,952 | 87,747 | 116,009 | 11,696 | 12,121 | 3,292 | 792,203 |
| 1932 | 478,252 | 92,539 | 385,713 | 48,973 | 3,888 | 6,960 | 4,664 | 3,451 | 61,312 | 79,837 | 85,871 | 13,883 | 6,450 | 1,816 | 702,818 |
| 1933 | 573,412 | 167,377 | 406,035 | 63,351 | 4,527 | 10,874 | 7,555 | 7,765 | 73,851 | 91,861 | 149,659 | 18,394 | 9,883 | 2,737 | 846,312 |
| 1934 | 677,361 | 211,803 | 465,558 | 79,746 | 10,492 | 17,233 | 11,103 | 17,545 | 87,400 | 112,058 | 175,470 | 20,170 | 8,903 | 2,985 | 1,008,663 |
| 1935 | 590,522 | 176,705 | 413,817 | 53,584 | 13,134 | 20,850 | 8,868 | 28,051 | 57,479 | 78,362 | 135,247 | 29,949 | 11,125 | 5,055 | 856,245 |
| 1934: | | | | | | | | | | | | | | | |
| April | 56,748 | 20,957 | 35,791 | 5,157 | 762 | 1,447 | 894 | 1,311 | 7,282 | 9,808 | 19,250 | 1,330 | 440 | 236 | 83,708 |
| May | 69,403 | 25,691 | 43,712 | 8,870 | 1,106 | 1,892 | 1,397 | 997 | 12,104 | 14,606 | 26,598 | 1,243 | 726 | 328 | 113,579 |
| June | 53,282 | 20,981 | 32,301 | 5,397 | 1,425 | 1,886 | 644 | 1,497 | 4,860 | 6,192 | 15,956 | 1,593 | 765 | 377 | 72,893 |
| July | 53,335 | 22,829 | 30,506 | 3,818 | 710 | 1,662 | 1,048 | 2,399 | 5,762 | 7,369 | 14,415 | 1,703 | 353 | 252 | 69,997 |
| Aug. | 52,641 | 17,865 | 34,776 | 4,948 | 552 | 1,714 | 1,048 | 1,908 | 5,340 | 8,901 | 11,356 | 1,610 | 710 | 251 | 73,114 |
| Sept. | 61,051 | 17,889 | 43,162 | 6,555 | 294 | 1,438 | 839 | 1,626 | 5,722 | 10,738 | 14,688 | 1,665 | 764 | 222 | 87,713 |
| Oct. | 47,045 | 10,226 | 36,819 | 6,544 | 413 | 1,412 | 1,196 | 1,328 | 5,970 | 6,643 | 5,556 | 1,413 | 840 | 401 | 68,535 |
| Nov. | 51,140 | 8,759 | 42,381 | 6,756 | 501 | 953 | 941 | 1,356 | 7,621 | 7,123 | 5,338 | 2,356 | 1,017 | 334 | 76,676 |
| Dec. | 59,575 | 15,375 | 44,200 | 8,481 | 990 | 1,237 | 680 | 2,043 | 10,865 | 12,953 | 12,354 | 2,956 | 1,035 | 239 | 98,033 |
| 1935 | | | | | | | | | | | | | | | |
| Jan. | 56,720 | 17,142 | 39,578 | 5,202 | 2,269 | 1,630 | 1,222 | 2,614 | 3,812 | 5,371 | 8,704 | 2,650 | 1,196 | 460 | 74,719 |
| Feb. | 50,593 | 17,676 | 32,917 | 5,556 | 731 | 1,887 | 760 | 2,288 | 4,395 | 7,663 | 15,194 | 2,076 | 636 | 254 | 74,154 |
| Mar. | 47,407 | 13,437 | 33,970 | 3,181 | 701 | 1,901 | 773 | 2,076 | 5,592 | 7,950 | 7,973 | 1,472 | 740 | 526 | 66,855 |
| Apr. | 53,360 | 16,029 | 37,331 | 2,976 | 370 | 1,895 | 846 | 1,661 | 5,574 | 6,873 | 12,683 | 2,827 | 963 | 185 | 74,957 |
| May | 51,353 | 23,720 | 27,633 | 4,223 | 674 | 2,323 | 848 | 2,752 | 6,217 | 7,931 | 21,058 | 2,138 | 832 | 315 | 76,920 |
| June | 49,751 | 18,637 | 31,114 | 3,525 | 1,077 | 2,031 | 603 | 2,869 | 5,698 | 8,258 | 14,168 | 2,021 | 659 | 393 | 72,416 |
| July | 48,975 | 11,257 | 37,718 | 4,106 | 580 | 1,870 | 1,164 | 1,939 | 5,899 | 5,664 | 8,373 | 2,015 | 427 | 407 | 70,162 |
| Aug. | 51,873 | 10,978 | 40,895 | 5,683 | 724 | 759 | 566 | 2,062 | 4,661 | 6,923 | 8,875 | 2,451 | 1,150 | 442 | 74,541 |
| Sept. | 51,247 | 10,418 | 40,829 | 3,970 | 681 | 1,797 | 421 | 2,278 | 4,089 | 5,862 | 9,422 | 2,248 | 1,017 | 493 | 73,107 |
| Oct. | 48,258 | 19,364 | 28,894 | 5,932 | 1,198 | 2,168 | 1,040 | 2,622 | 3,937 | 6,698 | 16,432 | 2,748 | 1,240 | 462 | 73,371 |
| Nov. | 43,147 | 10,518 | 32,629 | 4,288 | 1,806 | 1,356 | 455 | 2,155 | 3,724 | 3,963 | 8,511 | 2,392 | 936 | 587 | 62,802 |
| Dec. | 37,838 | 7,529 | 30,309 | 4,942 | 2,323 | 1,233 | 171 | 2,735 | 3,881 | 5,206 | 3,854 | 4,911 | 1,329 | 531 | 61,425 |
| 1936: | | | | | | | | | | | | | | | |
| Jan. | 39,101 | 12,582 | 26,519 | 4,131 | 1,293 | 2,317 | 938 | 1,665 | 4,315 | 6,347 | 9,270 | 2,449 | 1,606 | 613 | 61,463 |
| Feb. | 38,436 | 18,857 | 19,579 | 3,664 | 1,382 | 2,111 | 529 | 3,663 | 4,789 | 6,643 | 15,479 | 2,892 | 1,201 | 832 | 62,764 |
| Mar. | 46,552 | 12,026 | 34,526 | 4,336 | 1,324 | 1,848 | 342 | 2,966 | 4,484 | 5,052 | 8,949 | 2,553 | 1,264 | 586 | 68,230 |
| Apr. | 35,999 | 14,698 | 21,301 | 3,172 | 1,255 | 2,053 | 869 | 1,596 | 4,895 | 6,446 | 12,612 | 2,417 | 1,056 | 693 | 58,365 |
| May | 46,568 | 12,527 | 34,041 | 2,560 | 1,115 | 2,386 | 517 | 2,293 | 4,258 | 6,015 | 10,743 | 2,340 | 956 | 700 | 67,924 |

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, 2,439 in 1927, 1,437 in 1928, 2,670 in 1929, and 1,274 in 1930. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 93 tons in 1924, 6 tons in 1925, 20 tons in 1926, about ½ ton in 1927, and 1 ton in 1928, and practically none in 1929, 1930 and 1931. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons in 1924, 2,239 tons in 1925, 44 tons in 1926, 84 tons in 1927, 1,459 tons in 1928, 1,302 tons in 1929, and 2,656 tons in 1930. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands, and includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. * Figure is provisional: final figure will be shown when available.

NOTE: THE FIGURES FOR 1933 ARE REVISED AS OF JANUARY 25, 1935 AND REPRESENT FINAL FIGURES

# Net Imports of Crude Rubber into Principal Manufacturing Countries

(*Long Tons*)

| | United States [1] | United Kingdom | France (h) | Germany | Canada (ac) | Japan (da) | Italy | Russia (ce) | Australia (cd) | Belgium (d) | Netherlands | Scandinavia (abcdf) | Spain (g) | Czechoslovakia (abcd) | World Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1919 | 238,407 | 42,671 | 17,685 | 5,584 | 6,395 | 9,753 | 9,894 | 75 | 1,002 | 3,995 | 2,771 | 3,149 | 2,418 | 9 | 343,808 |
| 1920 | 249,530 | 56,844 | 13,885 | 11,890 | 11,746 | 5,297 | 6,123 | 62 | 1,815 | 3,840 | 5,510 | 2,292 | 2,008 | 567 | 371,409 |
| 1921 | 179,736 | 42,087 | 15,135 | 21,920 | 8,124 | 21,713 | 3,906 | 165 | 1,014 | 1,705 | 1,022 | 1,279 | 2,245 | 569 | 300,620 |
| 1922 | 296,594 | 11,724 | 24,352 | 27,546 | 9,207 | 15,934 | 6,430 | 2,493 | 2,643 | 172 | —3,807 | 1,778 | 589 | 567 | 396,222 |
| 1923 | 301,527 | 12,700 | 27,392 | 18,519 | 13,277 | 15,372 | 8,489 | 2,986 | 1,649 | 2,184 | 792 | 2,528 | 630 | 1,128 | 409,173 |
| 1924 | 319,103 | —11,550 | 30,446 | 22,727 | 14,299 | 19,571 | 8,764 | 2,346 | 3,124 | 2,688 | —807 | 3,178 | 944 | 1,370 | 416,203 |
| 1925 | 385,596 | 4,061 | 32,956 | 33,937 | 19,683 | 11,117 | 11,412 | 7,088 | 4,757 | 2,930 | 875 | 3,149 | 1,155 | 1,558 | 520,274 |
| 1926 | 399,981 | 84,865 | 34,240 | 22,775 | 20,229 | 18,125 | 9,809 | 6,529 | 9,021 | 2,498 | 2,670 | 4,046 | 1,299 | 1,870 | 617,957 |
| 1927 | 403,472 | 60,249 | 34,271 | 38,892 | 26,405 | 20,521 | 11,381 | 12,018 | 9,490 | 6,482 | 636 | 4,224 | 2,055 | 2,672 | 632,768 |
| 1928 | 407,572 | 4,846 | 36,498 | 37,855 | 30,447 | 25,621 | 12,433 | 15,134 | 8,430 | 7,958 | 2,243 | 4,418 | 3,178 | 3,138 | 599,771 |
| 1929 | 528,608 | 122,675 | 55,093 | 49,275 | 35,453 | 34,284 | 17,169 | 11,774 | 15,886 | 9,445 | 3,022 | 6,440 | 864 | 4,650 | 894,638 |
| 1930 | 458,036 | 120,069 | 68,503 | 45,488 | 28,793 | 33,039 | 18,639 | 16,387 | 5,354 | 10,635 | 2,924 | 7,710 | 2,400 | 4,468 | 822,445 |
| 1931 | 475,993 | 86,170 | 46,466 | 39,688 | 25,261 | 43,483 | 10,149 | 30,671 | 7,649 | 11,009 | 2,220 | 6,360 | 2,605 | 7,717 | 794,641 |
| 1932 | 393,844 | 44,086 | 42,506 | 45,121 | 20,917 | 56,027 | 14,469 | 30,637 | 12,576 | 9,519 | 2,851 | 7,262 | 4,359 | 9,444 | 693,618 |
| 1933 | 398,365 | 73,335 | 61,953 | 54,120 | 19,332 | 66,831 | 19,341 | 29,830 | 13,534 | 11,166 | 1,243 | 7,831 | 5,520 | 10,402 | 772,803 |
| 1934 | 439,172 | 158,482 | 49,560 | 59,330 | 28,439 | 69,905 | 21,398 | 47,271 | 9,642 | 9,115 | 3,758 | 12,418 | 6,900 | 10,999 | 926,389 |
| 1935 | 455,758 | 128,829 | 51,450 | 62,899 | 26,870 | 57,567 | 21,880 | | 9,978 | 7,593 | 4,068 | 11,878 | 8,140 | 11,245 | |
| 1934: | | | | | | | | | | | | | | | |
| Oct. | 27,323 | 18,897 | 3,424 | 2,148 | 3,043 | 7,227 | 1,296 | 3,681 | 798 | 693 | 447 | 813 | 675 | 254 | 70,719 |
| Nov. | 35,982 | 13,875 | 3,176 | 3,425 | 1,568 | 5,580 | 1,764 | 4,488 | 516 | 379 | 187 | 1,382 | 542 | 215 | 75,079 |
| Dec. | 17,305 | 15,816 | 3,605 | 5,207 | 2,849 | 3,904 | 1,979 | 6,460 | 1,312 | —168 | 139 | 1,143 | 615 | 762 | 60,928 |
| 1935 | | | | | | | | | | | | | | | |
| Jan. | 39,546 | 20,383 | 5,573 | 4,286 | 2,670 | 4,400 | 1,613 | 3,446 | 1,099 | 419 | 158 | 1,252 | 468 | 1,245 | 86,558 |
| Feb. | 45,999 | 15,609 | 4,593 | 3,513 | 1,558 | 5,582 | 4,356 | 1,810 | 848 | 399 | 477 | 838 | 567 | 1,836 | 87,985 |
| Mar. | 44,772 | 12,810 | 4,017 | 6,353 | 2,710 | 4,421 | 1,582 | 4,624 | 1,459 | 240 | 331 | 891 | 630 | 741 | 85,581 |
| Apr. | 40,061 | 11,574 | 3,306 | 5,820 | 1,063 | 6,635 | 1,653 | 3,387 | 1,150 | 520 | 329 | 1,049 | 432 | 789 | 78,115 |
| May | 29,962 | 12,498 | 3,828 | 6,049 | 3,929 | 5,429 | 935 | 1,937 | 671 | 982 | 272 | 853 | 815 | 774 | 68,934 |
| June | 31,410 | 10,253 | 3,210 | 4,551 | 1,435 | 3,373 | 1,831 | 3,087 | 496 | 1,065 | 446 | 780 | 745 | 604 | 66,286 |
| July | 47,694 | 9,454 | 3,247 | 4,929 | 1,319 | 4,484 | 1,298 | 1,823 | 520 | 572 | 157 | 800 | 548 | 185 | 77,030 |
| Aug. | 41,057 | 14,120 | 4,508 | 4,790 | 2,814 | 4,453 | 916 | 1,227 | 655 | 528 | 413 | 820 | 752 | 673 | 77,726 |
| Sept. | 35,256 | 11,223 | 3,740 | 5,453 | 1,604 | 3,590 | 1,696 | 1,593 | 449 | 806 | 282 | 1,030 | 793 | 914 | 68,429 |
| Oct. | 35,770 | 3,184 | 5,175 | 6,074 | 812 | 4,727 | 2,500* | 4,876 | 829 | 539 | 671 | 1,000 | 597 | 742 | 67,496 |
| Nov. | 25,756 | 2,942 | 4,731 | 6,258 | 4,389 | 4,361 | 2,000* | 4,858 | 783 | 449 | 245 | 1,206 | 1,044 | 1,276 | 60,298 |
| Dec. | 38,072 | 4,779 | 5,522 | 4,823 | 2,567 | 6,112 | 2,500* | | 1,019 | 1,074 | 287 | 1,359 | 750 | 1,466 | |
| 1936: | | | | | | | | | | | | | | | |
| Jan. | 33,260 | 4,573 | 6,755 | 5,545 | 1,759 | 4,355 | 1,500* | 467 | 1,260 | 760 | 369 | 736 | 664 | 767 | 62,770 |
| Feb. | 33,789 | 1,271 | 6,264 | 5,257 | 1,900 | 2,786 | 1,000* | 94 | 735 | 799 | 106 | 497 | 1,312 | 344 | 56,154 |
| Mar. | 33,743 | —1,227 | 4,333 | 4,569 | 1,811 | 5,170 | 1,000* | 4,376 | 819 | 1,033 | 339 | 754 | 1,113 | 410 | 58,243 |
| Apr. | 44,948 | 2,097 | 4,250 | 5,497 | 1,079 | 4,929 | 1,000* | | 919 | 1,097 | 238 | 848 | | | |
| May | 35,549 | 302 | | | | | | | | | 103 | | | | |

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. [1] United States imports of guayule are included in this compilation. * Figure is provisional; final figure will be shown immediately it becomes available.